This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

C3.5:C49 5

STANFORD UNIVERSITY
GOV'T DOCUMENT DEPARTMENT

DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
WM. J. HARRIS, DIRECTOR

SPECIAL REPORTS

GENERAL STATISTICS OF CITIES: 1909

INCLUDING

STATISTICS OF SEWERS AND SEWAGE DISPOSAL, REFUSE COLLECTION AND DISPOSAL, STREET CLEANING, DUST PREVENTION, HIGHWAYS, AND THE GENERAL HIGHWAY SERVICE OF CITIES HAVING A POPULATION OF OVER 30,000

PREPARED UNDER THE SUPERVISION OF LE GRAND POWERS
CHIEF STATISTICIAN FOR FINANCE AND MUNICIPAL STATISTICS

STANFORD LIBRARY

WASHINGTON
GOVERNMENT PRINTING OFFICE
1913

C3.222:900/SPR/CIT:909

187267

CONTENTS.

	Page.
INTRODUCTION	13–17
Historical	13
Purpose of report	13
Imperfect and incomplete statistical data	13
Correlation of financial and general statistics	13
Schemes for uniform accounts and reports	14
Requirements for a successful scheme of uniform accounts and reports	14
Primary classification of expenditures	14
Expenses	14
Outlays	14
Functional classifications	15
Accounts of different orders	15
No radical change in methods of accounting	15
Separate publication of financial and general statistics	15
Summary of prior statistics	15
Contents of this volume	16
Connection and interrelation of the services covered by this report	16

PART I.—SEWERS AND THE SEWER SERVICE.

CHARACTER AND IMPORTANCE OF SEWER SERVICE	18
The sewer service and census investigations relating thereto	18
Sewerage problems and public health	18
SEWER SERVICE ACCOUNTS, RECORDS, AND REPORTS	18–20
Inadequacy of records relating to sewers and the sewer service	18
Scheme of accounts	18
Distribution or incidental operating accounts	19
Subgeneral accounts	19
Outlay accounts	19
Revenue and appropriation accounts	19
Accounts for boards of public works	19
Financial reports by sewer departments	20
Physical records	20
SEWERS AND SEWER SERVICE STATISTICS	20–35
Sewer systems	20
Increase in sewer mileage: 1907–1909	21
Sewers classified by construction material	21
Manholes	22
Catch basins	22
Ventilation	23
Inverted siphons and siphons	23
Storm-water overflows	23
Distance from sewer outlet to nearest waterworks intake	23
Cost, or replacement value, of sewer systems	23
Sewer statistics of Table 2	24
Sewers built during the year	24
Methods of financing sewer construction	24
Charges or special assessments for sewer maintenance	27
Operation and maintenance of sewer systems	27
House connections	27
Flushing of sewers	28
Cleaning of sewers	29
Cleaning of catch basins	29
Volume of sewage	29
Pumping of sewage	30
Sewage purification systems	31
Sewage purification in tanks	31
Average detention period	31
Sludge produced	31

SEWERS AND SEWER SERVICE STATISTICS—Continued. Page.
Disposition of sludge 31
Chemicals used in the purification of sewage in chemical precipitation tanks 32
Cost of precipitation tanks 32
Sewage purification in filters 32
Miscellaneous information relating to sewage disposal 33
Removal of night soil 34

PART II.—REFUSE-DISPOSAL SERVICE.

REFUSE AND THE SERVICE FOR ITS COLLECTION AND DISPOSAL 36, 37
Classes of city refuse 36
The refuse disposal service and its importance 36
Systems of refuse collection 36
Methods of refuse disposal 37
Units of service 37
ACCOUNTS, RECORDS, AND REPORTS OF REFUSE-DISPOSAL SERVICE 37–39
Financial records 37
Scheme of accounts 37
Subgeneral and primary accounts 38
Revenue and appropriation accounts 38
Distribution or incidental operating accounts 38
Accounts other than those for refuse-disposal service 38
Reports of refuse-disposal expenses, outlays, revenues, and appropriations 38
Physical and general records 38
Records of employees and of work performed 38
Records of equipment and general information 39
COLLECTION OF REFUSE BY CITY EMPLOYEES AND CONTRACTORS 39–42
Statistics of refuse collection 39
Collection of household refuse under the combined system 39
Frequency of mixed refuse collection 40
Collection of garbage 40
Collection of ashes 40
Collection of rubbish 41
Collection of dead animals 42
SORTING OF REFUSE 42
Cities reporting the sorting of refuse 42
DISPOSAL OF REFUSE BY CITY EMPLOYEES AND CONTRACTORS 42–46
Growing problem of refuse disposal 42
Disposal of mixed refuse 42
Disposal of garbage by city employees 43
Disposal of garbage by contractors 44
Disposal of ashes 44
Disposal of rubbish 44
Disposal of waste paper 45
Disposal of dead animals 45
COLLECTION AND DISPOSAL OF REFUSE UNDER PRIVATE ARRANGEMENT OF HOUSEHOLDER 47, 48
Refuse collected and disposed of at householder's expense 47
Cities with private arrangements for collecting garbage 47
Regulations of private collection 47
Cities with private arrangements for collecting ashes 48
Cities with private arrangements for collecting rubbish 48
Cities with private arrangements for collecting waste paper 48
Cities with private arrangements for collecting butchers' and market wastes 48
Cities with private arrangements for collecting dead animals 48
REDUCTION PLANTS 49
Number of plants and their work 49
Reduction plants operated by private parties 49
Reduction plants operated by the city 49
INCINERATION PLANTS 50
General statistics 50
Refuse incineration plants operated by city 50
HORSES EMPLOYED BY CITY IN ITS REFUSE-DISPOSAL SERVICE 51
Statistics of horses employed 51
EXPENSES OF REFUSE-DISPOSAL SERVICE 51, 52
Source of financial data 51
Average costs of refuse-disposal service 51
Cost of removing dead animals 52
REVENUES FROM REFUSE DISPOSAL 52, 53
Cities obtaining revenues from refuse disposal 52

PART III.—STREET-CLEANING SERVICE.

Page.
DEFINITIONS, METHODS, AND NECESSITY OF SERVICE 54, 55
  Definitions 54
  Necessity for street cleaning 54
  Disposal of street cleanings 54
  Methods of street cleaning 55
  Snow and ice removal 55
ACCOUNTS, RECORDS, AND REPORTS OF STREET-CLEANING SERVICE 55, 56
  Uniform accounts and reports of street-cleaning service 55
  Physical or general records 56
  Records of contract street cleaning 56
STATISTICS OF STREET-CLEANING SERVICE 57, 58
  Contents of general tables 57
  Imperfections of statistics 57
  Highway areas cleaned 57
  Areas regularly cleaned 57
  Changes in the character of service 57
  Percentage of area swept 57
  Areas occasionally cleaned 57
  Frequency of street cleaning 58
  Average number of employees in street cleaning 58
  Statistics of snow and ice removal 58

PART IV.—DUST-PREVENTION SERVICE.

CHARACTER AND IMPORTANCE OF SERVICE 59
  Relation of service to public cleanliness and public health 59
  Relation of service to the general highway service 59
ACCOUNTS, RECORDS, AND REPORTS 59, 60
  Essentials for good accounts and reports 59
  Units of service 59
  Uniform accounts for service 59
STATISTICS OF DUST-PREVENTION SERVICE 60-62
  Street sprinkling with water 60
  Length and area of streets regularly sprinkled 60
  Sprinkling by car sprinklers 60
  Quantity of water used in sprinkling 61
  Cost of sprinkling 61
  Frequency of sprinkling with water 61
  Portions of street sprinkled 61
  Special assessments for street sprinkling with water 62
  Water sprinkling by private associations 62
  Dust preventives other than water 62

PART V.—HIGHWAYS AND GENERAL HIGHWAY SERVICE.

DEFINITIONS, ACCOUNTS, RECORDS, AND REPORTS 63, 64
  Definitions 63
  Requirements for uniform accounts and reports 63
  Scheme of accounts 63
  Distribution or incidental operating accounts 64
  Physical and general records 64
STATISTICS OF HIGHWAYS AND GENERAL HIGHWAY SERVICE 64-81
  Statistics of streets and alleys 64
  Length, area, and width of paved streets 65
  Streets with durable pavements 65
  Streets with nondurable pavements 65
  Durable street pavements, classified by kind of surface 66
  Sheet-asphalt pavements in streets 66
  Bitulithic pavements in streets 66
  Tar-bound macadam pavements in streets 66
  Granite and Belgian block pavements in streets 66
  Cobblestone pavements in streets 67
  Brick pavements in streets 67
  Creosoted wood-block pavements in streets 67
  Untreated wood-block pavements in streets 67
  Other durable pavements in streets 67
  Nondurable pavements in streets, classified by kind of surface 68
  Oil-bound macadam pavements in streets 68
  Water-bound macadam pavements in streets 68

STATISTICS OF HIGHWAYS AND GENERAL HIGHWAY SERVICE—Continued.

Page.
Water-bound gravel pavements in streets 68
Other oil or water bound pavements in streets 68
Comparisons between 1907 and 1909 68
Average life of street pavements 69
Street pavements laid by contract and by city employees 70
Cost of pavements laid in 1909 70
Sheet-asphalt pavements, classified according to the year in which laid 72
Bitulithic and tar-bound macadam pavements, classified according to the year in which laid 72
Creosoted wood-block pavements, classified according to the year in which laid 72
Brick pavements, classified according to the year in which laid 72
Water-bound macadam pavements, classified according to the year in which laid 72
Unpaved streets 74
Statistics of alleys 74
Asphalt repair plants operated by cities 74
Quarries operated by cities 75
Gravel pits operated by cities 75
Statistics of sidewalks 75
Highway bridges 76
Bridges over 50 feet in length 76
Cost of bridge construction 77
Bridges under 50 feet in length 77
Drawbridges 77
Elevated street railways 78
Steam-railroad crossings 78
Subways and tunnels for street cars 80
Conduits owned by city 80
Street lighting 80
Docks and wharves 81

PART VI.—STATISTICS OF SALARIES AND WAGES.

Contents of Table 33 82
Salaries of the highest paid officials 82
Salaries of foremen and inspectors 83
Wages of mechanics and skilled laborers 83
Wages of teamsters 84
Wages of unskilled laborers 84
LIST OF CITY NUMBERS 85

GENERAL TABLES.[1]

Table 1.—Sewers—General statistics of sewer systems: 1909 (20) 88
Table 2.—Sewers—Mileage at close of year, classified by character and by material of which constructed: 1909 (24) 94
Table 3.—Sewers—Mileage built during year: 1909 (24) 97
Table 4.—Sewers—Employees and expenses of operation and maintenance: 1909 (27) 100
Table 5.—Sewers—House connections: 1909 (27) 104
Table 6.—Sewers—Flushing of sewers and cleaning of sewers and catch basins: 1909 (28) 108
Table 7.—Sewers—Discharge of sewage: 1909 (29) 114
Table 8.—Sewers—Pumping of sewage: 1909 (30) 117
Table 9.—Sewers—Sewage-purification systems: 1909 (31) 118
Table 10.—Sewers—Sewage purification in tanks: 1909 (31) 119
Table 11.—Sewers—Sewage purification in filters: 1909 (32) 119
Table 12.—Refuse disposal—Quantity of garbage, ashes, and rubbish collected, number of employees engaged in service, and expenses of collection and disposal: 1909 (39) 120
Table 13.—Street cleaning—General statistics of street cleaning: 1909 (57) 124
Table 14.—Street cleaning—Area (square yards) of paved streets and alleys regularly cleaned, by specified methods and with stated frequency: 1909 (58) 130
Table 15.—Street cleaning—Average number of employees during the street-cleaning season: 1909 (58) 133
Table 16.—Street cleaning—Snow and ice removal: 1909 (58) 136
Table 17.—Dust prevention—Street sprinkling with water by city: 1909 (60) 138
Table 18.—Dust prevention—Use of dust preventives other than water: 1909 (62) 142
Table 19.—Highways—Mileage and per cent distribution of the length of streets and alleys, classified as with durable and nondurable pavements and as unpaved: 1909 (64) 148
Table 20.—Highways—Length, area, and average width of paved streets, classified as with durable and nondurable pavements, with per cent of the total length and area in each class: 1909 (65) 151
Table 21.—Highways—Length and area of principal kinds of paved streets, classified according to kind of surface: 1909 (65) 154
Table 22.—Highways—Area (square yards) of principal classes of street pavements laid by contractors and by city employees during the year: 1909 (70) 160

---

[1] Numbers in brackets following titles are those of pages on which begins the text discussion of the several tables.

Page.
Table 23.—Highways—Area (square yards) of sheet-asphalt pavements in specified cities at the close of the year, classified according to the year in which laid: 1909 (72) 163
Table 24.—Highways—Area (square yards) of bitulithic and bituminous or tar-bound macadam pavements in specified cities at the close of the year, classified according to the year in which laid: 1909 (72).... 165
Table 25.—Highways—Area (square yards) of creosoted wood-block pavements in specified cities at the close of the year, classified according to the year in which laid: 1909 (72) 167
Table 26.—Highways—Area (square yards) of brick pavements in specified cities at the close of the year, classified according to the year in which laid: 1909 (72) 168
Table 27.—Highways—Area (square yards) of water-bound macadam pavements in specified cities at the close of the year, classified according to the year in which laid: 1909 (72) 170
Table 28.—Highways—Length, area, and average width of alleys, classified according to kind of surface: 1909 (74).... 172
Table 29.—Highways—Length (miles) of sidewalks at the close of the year, classified according to kind of surface: 1909 (75).... 174
Table 30.—Highways—Statistics of bridges over 50 feet in length: 1909 (76).... 176
Table 31.—Highways—Number of bridges under 50 feet in length: 1909 (77).... 182
Table 32.—Highways—Statistics of street lighting: 1909 (80).... 184
Table 33.—Salaries and wages of specified classes of city employees: 1909 (82).... 190

LETTER OF TRANSMITTAL.

DEPARTMENT OF COMMERCE,
BUREAU OF THE CENSUS,
Washington, D. C., July 23, 1913.

SIR:

I have the honor to transmit herewith a report for the year 1909 relating to sewers and sewage disposal, refuse collection and disposal, street cleaning, dust prevention, and highways and the general highway service of cities; the report comprising that portion of the official statistics of cities having a population of over 30,000 to which is given the designation "General Statistics."

The report contains a large amount of statistical and other data relating to the branches or subdivisions of municipal service mentioned above. Somewhat similar statistics were published by this bureau for the years 1902, 1903, 1905, and 1907.

This report was prepared during the administration and in accordance with the plans of my predecessor, Hon. E. Dana Durand, under the direction of Le Grand Powers, chief statistician in charge of the compilation of statistics of cities, assisted by Ernst H. Meyer, Morris J. Hole, Charles P. Smith, and Lemuel A. Carruthers.

Very respectfully,

Wm J. Harris
Director of the Census.

Hon. WILLIAM C. REDFIELD,
Secretary of Commerce.

GENERAL STATISTICS OF CITIES
1909

STATISTICS OF CITIES HAVING A POPULATION OF OVER 30,000.

STATISTICS OF SEWERS, WASTE COLLECTION AND DISPOSAL, AND HIGHWAYS: 1909.

INTRODUCTION.

Historical.—The Congress of the United States in 1898 authorized the Department of Labor annually to collect and publish the official statistics of cities having a population of over 30,000. The Department of Labor printed its first statistics collected and compiled under the provisions of that act in September, 1899. Similar statistics were collected and published by the department each subsequent year up to and including 1902, making four reports in all.

The Secretary of the Department of Commerce and Labor under the provisions of the act of Congress approved February 14, 1903, creating that department, by an executive order transferred the collection and publication of the statistics of cities authorized by the act of 1898 from the then Bureau of Labor (formerly the Department of Labor) to the Bureau of the Census.

Under the authority of the act mentioned, as well as of the act creating the permanent Census Office, the Bureau of the Census began the work of collecting and compiling its statistics of cities. A bulletin of those statistics (for all cities having a population of over 25,000) was published by the bureau in 1905, and contained statistics for the years 1902 and 1903. For the year 1903 the bureau also issued a special bulletin containing statistics of cities having a population of from 8,000 to 25,000. For the year 1904 it issued its first bulletin, exclusively devoted to the statistics of cities having a population of over 30,000. Since then reports have been issued annually containing statistics for the last-named class of cities. Some of these reports presented financial statistics only, and others both financial and general or physical statistics. In the case of the latter class of reports the greater prominence was given to financial statistics.

Beginnings were made in the reports for 1905 and 1907 of the correlation of the physical and financial statistics, with a view of securing a statement of the relative costs of certain services in the different cities. Those reports contained statistics of the per capita costs of cleaning streets, and the costs of such cleaning per 1,000 square yards subject to regular cleaning, and per 1,000,000 square yards cleaned. In the same manner were presented similar comparative figures for other classes of municipal activities, including those showing the cost of refuse collection and disposal per capita and per ton of refuse.

Purpose of report.—In the present report the Bureau of the Census aims to present general and physical statistics which are of administrative value or popular interest relative to several important municipal services. Among the subjects treated are the equipment of the different services, the work accomplished by them, the methods of operation, the force employed, wages and salaries paid, efficiency as indicated by the ratio of the force employed to the work accomplished, and, whenever possible, the economy of the service as indicated by the cost per unit of work performed.

Imperfect and incomplete statistical data.—In its work of collecting and compiling statistics, the Bureau of the Census discovered that the physical or general records of cities were in many instances wholly lacking, or else were so manifestly inaccurate as to limit to narrow bounds the field within which comparative statistics of any value could be compiled. This fact was pointed out in the reports for 1905 and 1907, and the statement was made that until cities provide more accurate and more fully correlated financial and physical data no statistics can be compiled by the Bureau of the Census or by the individual cities which will satisfactorily exhibit the costs of the various municipal services and the quantity and quality of the work performed. It is believed, however, that the prior publication by the Bureau of the Census of such statistics has not been wholly fruitless, since it has called attention to the value of comparative municipal statistics and has assisted in establishing, by cooperation and conference with committees, city officials, and students of the subject, the bases on which may ultimately be compiled statistics that will accurately measure the efficiency and economy of municipal administration.

Correlation of financial and general statistics.—Within the last few years a large number of cities have installed new and scientific systems of accounts for recording financial data. In these accounts receipts and payments are classified with reference to the source of receipt and the object of payment. The adoption of such a classification is a long step in the right direction, but the most beneficial results can not be realized without the installation of complete physical records, or records of work done or services performed supplementing and correlating with the records of expenditures; since it is only when the information contained in the physical records is correlated with that of the financial records that it is possible to determine the efficiency and economy with which the services are conducted.

The correlation of physical and financial data is, however, possible only by the prior establishment of common units of service in the two records. This fact is at present but seldom fully recognized. In many of the cities installing these financial accounts the physical and general records are left in confusion, and as a result the financial accounts and reports are of no very great administrative value. This condition will continue to exist until units of work or service are adopted and clearly defined for the physical and general records and the financial accounts are correlated with them. Further, both financial and physical records should be uniform as between city and city to make the experience of one city of any value to the officials of other cities, since without such uniformity the expenses of one city can not be compared with those of another, as may be seen by placing the expenses of City A, which reports the cost of street cleaning at a given rate per mile of street cleaned, by the side of those of City B, which reports it at a specified rate per cartload of sweepings removed, or by trying to test the comparative cost of street paving per square yard in two cities if nothing is known as to the kind of materials used or method of construction in the two places.

In this publication the effort to correlate financial and physical statistics so as to secure figures measuring administrative efficiency and economy has been carried as far as practicable with the available data. In fact, the student of the subject will doubtless conclude that in some instances the inconsistencies of the comparative figures presented indicate that the correlation has been carried to the breaking point, and that certain figures have little significance because of incompleteness or inaccuracy of the fundamental data on which they are based. But if the publication of this volume becomes, as have its predecessors, an object lesson disclosing the imperfections of city records and accounts and stimulating their improvement, it will not be wholly in vain. The present volume, reflecting as a mirror the lack of existing accurate statistical data, will serve to illustrate the obstacles to be overcome before truly comparable statistics are attainable.

Schemes for uniform accounts and reports.—To assist in advancing the movement for uniform accounts and reports on which must depend the possibility of compiling trustworthy comparative statistics, and statistics measuring the economy and efficiency of municipal administration, the Bureau of the Census has prepared schemes of standard uniform accounts and reports for several different branches of municipal activity. It is hoped that by cooperation and correspondence with city officials and with others interested in the subject these accounts and forms may be perfected and then adopted by the various cities.

Requirements for a successful scheme of uniform accounts and reports.—A scheme for uniform accounting and reporting, to have any administrative value, must have the following characteristics: (1) Its accounts must be so arranged and the data to be recorded therein so classified that summaries of results are provided along fixed lines and upon common bases, so that comparisons can be made between the summaries for different fiscal periods and between those of similar departments or activities in different cities; (2) its bases of classification must be such that the summaries secured will provide the data for computing all the unit costs of service that are of administrative significance; and (3) its accounts must be given such names and numbers as will make the system readily understood and easy of application, and readily adjustable to conditions in cities differing widely in size, volume of business, and form of municipal organization.

Primary classification of expenditures.—The primary classification of expenditures for any service adapted to meet the foregoing requirements is one which (1) separates the governmental costs of cities into those designated by the Bureau of the Census as "expenses" and "outlays," and (2) separates the costs of each department or object of expenditure from those of other departments or objects of expenditure.

Expenses.—Municipal expenses are the costs of conducting municipal business and municipal activities, including the costs of caring for and maintaining or repairing and replacing municipal properties and public improvements. These expenses are of two kinds, general and functional. The *general expenses* are the expenses of general administration or the expenses which are sometimes called "overhead charges." The *functional expenses* are the expenses of the various departments or branches of governmental service, such as those of the police or fire department, and highway or refuse disposal service.

Outlays.—Municipal outlays are the costs of constructing or acquiring the more or less permanent properties and public improvements of municipalities. Outlays may be grouped, as are the expenses, into general and functional outlays, *general outlays* being the costs of acquiring and constructing properties and equipment used for general administrative purposes, and *functional outlays* being the costs of providing the properties and public improvements that are used in the various branches or departments of municipal service.

Functional classifications.—Scarcely less important than the classification of the costs of government into expenses and outlays is the complete segregation of those costs according to the functional activities. But few cities have attempted to make such classifications for all services, even in an elementary fashion. This is probably due in large part to a confusion as to a proper segregation of functions within one common service, or the failure to carry the principle of classification far enough. Yet cost statistics can have no accurate scientific or administrative value unless they are grouped definitely according to the precise work or service to which such costs relate.

Accounts of different orders.—In the schemes of accounts which are suggested on later pages of this report for adoption by the different municipal services as the bases for uniform and standard forms of reporting expenses, outlays, revenues, and appropriations, accounts of different orders are provided, and each account is given a name as fully descriptive as is practicable of the data to be recorded therein, and is also given a number showing its relations to all the other accounts. The accounts of the first order are called *summary accounts;* those of the second order, *general accounts;* those of the third order, *subgeneral accounts;* those of the fourth order, *primary accounts;* and those of the fifth order, *subprimary accounts.* The numbers given to the accounts of the first order are expressed by one digit, those of the second order by two, those of the third order by three, those of the fourth order by four, and those of the fifth order by five. All general accounts, or accounts numbered with two digits, are summed up or closed out into the summary account having a number identical with the first digit of the number of the general account; and in like manner all subgeneral or three-digit accounts are summed up and closed into the general account whose number is identical with the first two digits of that of the subgeneral account so closed. In the same general way the accounts with four digits are closed into one with three digits, and those with five digits are closed into one with four digits.

On pages 18, 37, 55, 60, and 63 are presented outline schemes of accounts arranged in accordance with the above-described principles, but the summary and general accounts, being the only ones that are of use in computing unit costs of service, are the only ones which are there presented in detail; instructions are, however, given on pages 19, 38, and 55 for arranging such numbers of three-digit, four-digit, or five-digit accounts as the character of service may require, or as the individual city may desire.

No radical change in methods of accounting.—Cities adopting the system of uniform accounts suggested in this report and the resulting forms for reporting expenditures, will not be compelled to make radical changes in their methods of bookkeeping or systems of accounting. Those among them whose accounts with financial transactions are statements of cash receipts and of cash or warrant payments may continue to keep their accounts and make their reports on that basis; while those whose accounts of financial income include those of accrued revenues and their accounts with governmental costs are records of audited bills and claims will find no difficulty in adopting the classification here suggested. Further, the adoption by cities using either one of these methods of recording expenditures of the classification here suggested will in no way interfere with a subsequent adoption of the other method of accounting.

Separate publication of financial and general statistics.—In all the preceding bulletins and reports containing statistics of cities the Bureau of the Census has included its physical and general statistics in the same volume with its financial statistics. For the year 1909 the two classes of statistics are published in separate volumes.

Summary of prior statistics.—The physical and general statistics of cities presented in reports of former years covered a considerable field, as is indicated by the following summary, in which the years for which the several inquiries were conducted are indicated in brackets after the subjects of the inquiries:

Almshouses.—Municipal almshouses and municipal hospitals (1902–1903, 1905, and 1907).

Baths.—Bathhouses and bathing beaches (1905 and 1907).

Building.—Building permits issued (1902–1903, 1905, and 1907).

Cleaning.—Street cleaning (1902–1903, 1905, and 1907).

Electric.—Municipal electric-light plants (1902–1903 and 1905). Municipal electric-light and power plants (1907).

Fire department.—Firemen, fire equipment, fire alarms, fire and property loss from fires (1902–1903, 1905, and 1907).

Gas.—Municipal gas works (1902–1903, 1905, and 1907).

Highways.—Area and length of streets, length of street railway (1902–1903, 1905, and 1907); care of streets (1902–1903, 1905, and 1907).

Juvenile courts and disposition of juvenile offenders (1905 and 1907).

Libraries.—Municipal public libraries (1902, 1905, and 1907); school and institutional libraries (1907).

Lighting.—Street lights (1902–1903, 1905, and 1907); average number of specified kinds of street lights to 100 miles of streets (1907).

Liquor traffic.—Retail liquor saloons and license fees (1902–1903, 1905, and 1907).

Parks.—Area of public parks (1902–1903, 1905, and 1907); zoological parks and collections (1905 and 1907).

Playgrounds.—Playgrounds (1905 and 1907).

Police department.—Patrolmen and officers of the police department (1902–1903, 1905, and 1907); other employees of the police department (1902–1903, 1905, and 1907); system of patrol relief (1905 and 1907); number of employees of police department (1907); equipment of police department (1905 and 1907); number of police in proportion to population, land area, and length of improved streets, together with pay of officers and patrolmen (1907); arrests classified by offense, together with the per cent distribution of arrests by offenses (1907); arrests of children classified by offense (1905 and 1907); arrests for specified offenses per 10,000 inhabitants and per policemen (1907); arrests of females, classified by offense (1907).

Public health.—Food and sanitary inspection (1902–1903, 1905, and 1907); milk and dairy inspection (1907).

Refuse disposal.—Disposal of ashes, garbage, and other refuse (1902–1903, 1905, and 1907).

Schools.—Public school buildings, school rooms, and school teachers (1902–1903 and 1907); pupils registered and average attendance in public schools (1902–1903).

Sewage disposal.—Miles of sewers (1902–1903, 1905, and 1907).

Sprinkling.—Street sprinkling (1905 and 1907).

Water supply.—Waterworks (1902–1903).

Contents of this volume.—The statistics of this volume are presented in six general parts or divisions. The first relates to sewers and the sewer service; the second to the refuse disposal service; the third to the street-cleaning service; the fourth to the dust-prevention service; the fifth to highways and the general highway service; and the sixth summarizes the information collected relating to the salaries and wages of city employees engaged in the various branches of work to which this report relates.

Connection and interrelation of the services covered by this report.—The 158 cities for which statistics are here presented vary greatly in the details of their governmental organizations for the construction and administration of sewers, the collection and disposal of refuse, street cleaning, dust prevention, and the construction, maintenance, and care of highways. In by far the greater number of cities, however, these various services are connected and interrelated to a greater or less extent. In 145 cities the construction and general oversight of sewers was in 1909 under the same general authority as that of highways; in 12, only, were the sewers under a department whose administration was entirely separate from that of highways, while in Atlantic City, N. J., the sewer system is owned by a private corporation and hence the city has no municipal sewer department.

The 12 cities in which the management of the sewers was entirely separate from that of the highways are as follows: New Orleans, La., Worcester and Cambridge, Mass.; Trenton, N. J.; San Antonio and Houston, Tex.; Somerville, Mass.; Fort Worth, Tex.; Brockton, Mass.; Jacksonville, Fla.; New Britain, Conn., and Taunton, Mass.

The reasons that the sewers and highways in the great majority of cities are under the management of a common administration are that both require for their construction the assistance and direction of trained engineers, and that the best results in both branches of the service can be secured only by a close cooperation if not identity of supervision and control. The administrative expediency above mentioned, which has so generally brought these two departments of city service under the same general management, has likewise in very many cities brought under the same control the construction, maintenance, and operation of water works, the cleaning and sprinkling of streets, and the collection and disposal of refuse. The extent of this common control is evidenced by the fact that 123 of the 145 cities having a common general administration of sewers and highways assign to such administration the supervision and control of street cleaning and dust prevention, and 60 also give to the same authority the entire control over the collection or disposal or both collection and disposal of refuse. When it is remembered that many of these 145 cities make no municipal provision for the collection and disposal of refuse, and that some of them do not have any municipal expenditure for dust prevention, it will be seen that the figures do not fully show the extent to which the control of constructing streets and sewers and that of cleaning streets and laying the dust therein and of collecting and disposing of refuse are combined under the same authority.

Of the 12 cities above mentioned which have wholly separated the administration of sewers from that of streets, 9 gave to the highway department the control over street cleaning and dust prevention, and 3 gave to that department the control over the collection and disposal of refuse, street cleaning, and dust prevention.

The administration of street cleaning was separated from that of the highway or from the joint administration of the streets and sewers or of the streets and some other department or branch of the service in only 21 of the 158 cities. The administration of dust prevention is thus separated in 23 cities, and that of refuse collection and disposal in 72 of the cities in which it has been undertaken as a municipal activity.

In the 21 cities in which the administration of street cleaning is separated wholly from that of the highways or the joint administration of highways and other branches of the service, that service is administered as follows: In Atlanta and Macon, Ga., by the health department; in San Antonio, Tex., by a street cleaning and sanitary department; in Montgomery, Ala., by a sanitary department; in Richmond, Va., and Joliet, Ill., by separate departments for street cleaning and refuse disposal; in 8 cities combined with dust prevention in special departments, and in 7 cities organized as an independent service.

In 9 of the 23 cities in which dust prevention was not under the administration of a highway department or under the supervision of a board or office having joint control over highways and other branches of service, it was under the same administration as street cleaning; in 9 it was under the same administration as street cleaning and refuse disposal; and in 5 it was administered under independent authority.

As mentioned above, the collection and disposal of refuse was in exclusive charge of the authority having control of sewers and highways in 60 cities, and of the authority having control of highways but not of sewers in 3 cities. These 63 cities are as follows:

New York, N. Y.
Chicago, Ill.
Philadelphia, Pa.
St. Louis, Mo.
Boston, Mass.
Cleveland, Ohio.

Detroit, Mich.
Buffalo, N. Y.
Cincinnati, Ohio.
New Orleans, La.
Los Angeles, Cal.
Jersey City, N. J.
Indianapolis, Ind.
Louisville, Ky.
Seattle, Wash.
Rochester, N. Y.
Columbus, Ohio.
Toledo, Ohio.
Syracuse, N. Y.
Scranton, Pa.
Oakland, Cal.
Nashville, Tenn.
Cambridge, Mass.
Dayton, Ohio.
Hartford, Conn.
Reading, Pa.
Camden, N. J.
Dallas, Tex.
Springfield, Mass.
Troy, N. Y.
Yonkers, N. Y.
Utica, N. Y.
Hoboken, N. J.
Evansville, Ind.
Birmingham, Ala.
Norfolk, Va.
Wilkes-Barre, Pa.
Savannah, Ga.
Fort Wayne, Ind.
Charleston, S. C.
Portland, Me.
Terre Haute, Ind.
Holyoke, Mass.
Jacksonville, Fla.
Bayonne, N. J.
Covington, Ky.
South Bend, Ind.
Passaic, N. J.
Mobile, Ala.
Saginaw, Mich.
Canton, Ohio.
Lancaster, Pa.
Springfield, Ohio.
Bay City, Mich.
York, Pa.
Chattanooga, Tenn.
Sacramento, Cal.
Butte, Mont.
Chester, Pa.
Knoxville, Tenn.
West Hoboken, N. J.
Joliet, Ill.
Newport, Ky.

In the remaining 72 cities in which the collection or disposal or both collection and disposal of refuse constituted a municipal activity, this service was directed as follows:

By the health department alone, in the following 44 cities:

Pittsburgh, Pa.
Kansas City, Mo.
Providence, R. I.
St. Paul, Minn.
Denver, Colo.
Portland, Oreg.
Atlanta, Ga.
Paterson, N. J.
Memphis, Tenn.
Lowell, Mass.
Albany, N. Y.
Bridgeport, Conn.
Spokane, Wash.
Salt Lake City, Utah.
Lynn, Mass.
Lawrence, Mass.
Youngstown, Ohio.
Duluth, Minn.
Somerville, Mass.
Waterbury, Conn.
Elizabeth, N. J.
Johnstown, Pa.
Oklahoma City, Okla
Allentown, Pa.
Pawtucket, R. I.
Binghamton, N. Y.
Sioux City, Iowa.
Atlantic City, N. J.
Rockford, Ill.
Malden, Mass.
Pueblo, Colo.
New Britain, Conn.
Davenport, Iowa.
McKeesport, Pa.
Wheeling, W. Va.
Superior, Wis.
Dubuque, Iowa.
Kalamazoo, Mich.
Galveston, Tex.
Quincy, Ill.
Macon, Ga.
Auburn, N. Y.
Chelsea, Mass.
La Crosse, Wis.

By the health department jointly with some other department, usually the street department, in the following 17 cities:

Milwaukee, Wis.
Newark, N. J.
Minneapolis, Minn.
New Haven, Conn.
Fall River, Mass.
Grand Rapids, Mich.
New Bedford, Mass.
Wilmington, Del.
East St. Louis, Ill.
Brockton, Mass.
Haverhill, Mass.
Salem, Mass.
Augusta, Ga.
Newton, Mass.
Fitchburg, Mass.
Everett, Mass.
Manchester, N. H.

By an independent authority other than the health department, in the 6 cities of the following list, in which the name of the authority in charge is shown after each city:

Worcester, Mass. (overseer of the poor).
Trenton, N. J. (department of garbage and ashes).
Houston, Tex. (garbage department).
Kansas City, Kans. (police department).
Harrisburg, Pa. (commissioner of council).
Taunton, Mass. (poor department).

By the street-cleaning department, in 3 cities: Baltimore, Md., Washington, D. C., and Richmond, Va.

By the street-cleaning and sanitary department, in San Antonio, Tex.

By the sanitary department, in Montgomery, Ala.

In most of the 17 cities in which the health department and some other department had joint control of refuse disposal, the health department's supervision extended only to the collection and disposal of garbage; the other department, in many cases the street department, collected and disposed of the ashes and rubbish. Such was the case in Milwaukee, Wis.; New Bedford, Mass.; Wilmington, Del.; East St. Louis, Ill.; Salem, Newton, Fitchburg, and Everett, Mass.; and probably in other cities.

In several cities refuse disposal was in charge of the poor department. Where such was the case, garbage was usually collected and fed to hogs kept on the city poor farm. This was done in Brockton, Worcester, and Taunton, Mass.

From the foregoing it can be seen that the most common practice of our American cities is to place the cleaning of streets and the laying of dust therein under the control of the highway department or under a board of public works or other body exercising control over sewers and highways, while the work of refuse collection is divided more or less evenly among the highway and other departments.

PART I.—SEWERS AND THE SEWER SERVICE.

CHARACTER AND IMPORTANCE OF SEWER SERVICE.

The sewer service and Census investigations relating thereto.—In this report the Bureau of the Census uses the designation *the sewer service* in referring to that branch or subdivision of municipal governmental service which relates to the care and maintenance of sewers and the disposal of sewage. The investigation relating to this governmental service, the results of which are presented in this report, is a continuation in a somewhat expanded form of similar investigations made for the years 1903, 1905, and 1907. Because of the known imperfection of the physical and financial records of many cities, the investigation was confined to a small number of inquiries; and yet considerable difficulty was experienced in securing the information which the Bureau of the Census endeavored to collect. The numerous inconsistencies in the comparative figures presented result from the incompleteness or inaccuracy of the data secured.

Sewerage problems and public health.—Until a comparatively recent date, the problem of sewage disposal, apart from and in addition to that of the construction of sewer systems, was of little moment. The small volume of sewage produced by the isolated and comparatively small cities could be discharged into streams without giving rise to serious results. But with the increase in the number and population of cities obtaining their water supply from rivers, lakes, and streams, the problem of the disposal of sewage has become one of great and growing importance and one extremely difficult of satisfactory solution, being in its relation to the health of cities second only to the problem of the municipal water supply. Pollution of rivers by sewage is a potent cause of typhoid fever, cholera, and other diseases in cities using such streams as a source of water supply. This pollution also gives rise to the following lesser evils: (1) It renders the water unfit for use by farm stock; (2) it destroys the fish life in streams; (3) in many cases it causes nuisances by reason of the deposit of putrescent matter along the banks and on bars of such rivers; and (4) it lessens the value of property for residential purposes.

SEWER SERVICE ACCOUNTS, RECORDS, AND REPORTS.

Inadequacy of records relating to sewers and the sewer service.—The lack of completeness and accuracy in the physical records of our municipalities has been clearly brought out by this investigation. Many cities were unable to furnish such physical facts as the number of miles of their main and lateral sewers; other cities had no record of the number of manholes or catch basins; a large number could not give the number of house connections, the mileage of sewers cleaned during the year, or the number of miles of sewers that were subject to flushing.

Financial records are scarcely more satisfactory. In many cities the sewer department does not attempt to record in detail its expenditures. This work is left entirely to the auditor of the city, and he, being concerned principally with keeping a record which will prove the fidelity with which he has conducted his office, does not keep accounts in such a way as to permit their correlation with the physical or general statistics of the other departments.

Scheme of accounts.—In a number of cities recognition of the importance of the subject has led those in charge of the sewer departments to install and keep correlated financial and general records designed to assist in determining the administrative efficiency and economy of the department. Similar records should be kept in all cities. To be of the greatest service, these records should be as nearly uniform as practicable for the different cities, and should be so designed that they will provide the data for computing the unit costs of every service, and lead to the preparation of reports which will enable the expenses of one city to be compared with those of others.

To assist in the early introduction of such accounts and the preparation of such reports, the Bureau of the Census here presents a brief outline scheme of accounts and a standard form of reporting the financial transactions of sewer departments. This scheme has been prepared in accordance with the general principle relating to uniform accounts and reports given on pages 14 and 15, and includes the two orders of accounts to which were given the names "summary" and "general."

Accounts for expenses:
- 0. General or administrative expenses.
    - 01–09. General accounts as needed.
- 1. Expenses of inspecting, cleaning, and flushing.
    - 10. Inspecting sewer system.
    - 11. Cleaning main sewers.
    - 12. Cleaning lateral sewers.
    - 13. Cleaning intercepting sewers.
    - 14. Cleaning catch basins.
    - 15. Other sewer cleaning.
    - 16. Flushing sewers and catch basins.

2. Expenses of repairing and rebuilding sewer systems.
    20. Repairing and rebuilding main sewers.
    21. Repairing and rebuilding lateral sewers.
    22. Repairing and rebuilding intercepting sewers.
    23. Repairing and rebuilding catch basins.
    24. Repairing and rebuilding manholes.
    25. Repairing and rebuilding house connections.
3. Expenses of operating sewage-disposal plant.
    30. Operating pumps.
    31. Operating chemical precipitation tanks.
    32. Operating septic tanks.
    33. Operating settling tanks.
    34. Operating sand filter beds.
    35. Operating contact beds.
    36. Operating percolating, sprinkling, and trickling filter beds.
4. Expenses of repairing and rebuilding sewage-disposal plants.
    40. Repairing and rebuilding pumps.
    41. Repairing and rebuilding chemical precipitation tanks.
    42. Repairing and rebuilding septic tanks.
    43. Repairing and rebuilding settling tanks.
    44. Repairing and rebuilding sand filter beds.
    45. Repairing and rebuilding contact beds.
    46. Repairing and rebuilding percolating, sprinkling, and trickling filter beds.

5, 6, 7. Together with subordinate general accounts as needed. These accounts are to be used as distribution or incidental operating accounts, or for recording the expenses of other functional activities of the department or office in administrative control of sewers and sewage disposal. All such accounts should be given significant or descriptive titles, and grouped in accordance with the principles elsewhere set forth, and given numbers of one, two, or three digits, according to their relative importance or their position among the accounts.

Accounts for outlays:

8. Outlays for sewers and sewage-disposal systems.
    80. Equipment of sewer department.
    81. Main sewers.
    82. Lateral sewers.
    83. Intercepting sewers.
    84. Manholes.
    85. Catch basins.
    86. Pumping stations.
    87. Tanks for purification of sewage.
    88. Beds for purification of sewage.
    89. Other objects.

Accounts for revenues and appropriations:

9. Summary accounts for revenues and appropriations.
    90–99. (General accounts as needed.)

Distribution or incidental operating accounts.—In consequence of the differences in the organization of the sewer department force in different cities and by reason of the fact that the work is sometimes done by contract and sometimes by hired labor, many variations must exist in the accounts required by the different cities for providing the data necessary for strictly comparable reports. The principal variations of this class naturally will be found in the distribution or incidental operating accounts, such as those with engineering work, stables, repair shops, storehouses, city yards, care and repair of carts, wagons, etc. These and all similar accounts should be so kept that they may be periodically closed into the other accounts with expenses and outlays, classified as stated above for accounts 0 to 4 and account 8. They should be given names and numbers as directed above under 5, 6, and 7.

Subgeneral accounts.—It is both practicable and desirable for most cities, especially those with a population exceeding 100,000, in reporting sewer expenses and outlays to exhibit their costs in greater detail than is indicated above. Thus expenses such as those under accounts numbered 11, 12, 13, 21, and 41, and outlays under accounts of all numbers may with good results be separated into such items as "salaries," "wages," "teaming" (namely, work of teamsters with teams), "materials," "contract work," etc., or such others as may be found of local administrative value or popular interest. Subordinate accounts for recording items such as these are here called subgeneral, and are indicated by three-digit numerals, as has previously been stated on page 15. Further, if all the accounting needs of a given city can not be met by the use of accounts numbered with one, two, and three digits, others may be employed with four or even five digits, as explained on the page mentioned.

Outlay accounts.—Outlay accounts should be so kept as to show separately the expenditures for the construction of each class of sewers and for equipment, care being taken that all costs of repairs and replacements are excluded and charged as expenses. Three and four digit accounts may be kept subordinate to the accounts given, in which to record separately the cost of constructing sewers of different sizes and materials.

Revenue and appropriation accounts.—The details of appropriations vary so much in different cities, and the local customs of accounting for moneys received by sewer departments as compensation for services performed are so diverse, that no attempt is here made to list the principal ledger accounts of revenues and appropriations for the sewer service. Accounts for revenues and appropriations should be given numbers from 90 to 99, but these accounts should be organized entirely independent of the expense and outlay accounts, and amounts received for services rendered or materials sold by the department should never be deducted from the amounts recorded in the general or functional expense accounts. If it is desirable to show the relation of the revenue derived from services to the costs of those services the comparison should be made in separate summaries, but not in the accounts set forth in the foregoing scheme.

Accounts for boards of public works.—If sewers are under the administration of a board of public works, or a board, commission, or officer having charge of highways and a number of such governmental services as those of street cleaning, dust prevention, and refuse disposal, it will be necessary to modify the foregoing scheme of accounts by making the summary account shown in the foregoing scheme the general account of the scheme for the board of public works, in which the summary accounts are those in which are summed up the expenses and outlays of the several branches of the service. In such an event the names and numbers of the summary accounts for the expenses of the board of public works would be substantially as follows:

0. Administrative expenses of board of public works.
1. Expenses of sewer service.
2. Expenses of refuse disposal service.
3. Expenses of highway service.
4.}
5.}Expenses of other services as needed.
6.}

If such a system were necessary, the sewer accounts previously given the numbers 0, 1, 2, 3, and 4 would be numbered 10, 11, 12, 13, and 14. In like manner all the present two-digit accounts would become three-digit accounts by writing the figure (1) before the numbers given in the foregoing scheme. This last rule would apply to the outlay accounts as well as to the expense accounts.

Financial reports by sewer departments.—With accounts arranged on the uniform basis outlined above, it will be easy for cities to prepare reports that are strictly comparable as between one year and another, and as between different cities. All statements in the annual report of expenses, outlays, revenues, and appropriations should be *net;* that is, the total, less any amounts charged, credited, paid, or received in error, and later corrected by refund receipts or payments. When accounts are on the basis of cash and warrant payments, the rule last given calls for a separate report of all payments and receipts in error and receipts and payments in correction of error.

Physical records.—No attempt is made in this report to give a complete list of the physical records that should be kept by officials of the sewer departments. In a general way it may, however, be said that general records should be kept of the number and services of superintendents, clerks, and other office employees, as well as of the number and services of all classes of sewer department employees. In addition, such physical records should be kept as those recording the number of stables, repair shops, storehouses, city yards, etc., and the number of horses, carts, and wagons of different types owned at the beginning of the year, acquired during the year, and on hand at the close of the year.

Records should be maintained of the number of miles of the different kinds of sewers in the system at the beginning of the year, constructed during the year, and in the system at the close of the year, all classified according to material of construction, size, shape, etc. In the same manner, records should be kept of the number of manholes, catch basins, inverted siphons, storm water overflows, and all elements of the sewer system.

Records should be kept of the number of miles of sewers subject to flushing, the schedule of flushing, the grade of the sewers flushed, the number of automatic and portable flush tanks, the number of direct connections, and, if obtainable, the number of gallons of water used for flushing, together with the number of stoppages occurring in the sewer system proper, that is, in the main and lateral sewers. Records should be kept of the number of catch basins in the system, and also of the number of such basins cleaned during the year, and of the quantity of material removed from them.

All other physical facts that are of value in arriving at a correct idea of the efficiency of the sewer department should be carefully recorded and reported, among them being the volume of sewage and its composition. The last-mentioned information is valuable as showing the extent to which manufacturing wastes enter into the sewage and make flushing and cleaning difficult.

SEWER AND SEWER SERVICE STATISTICS.

Sewer systems.—Table 1 presents a summary of the principal facts relating to sewer systems at the close of 1909, together with a statement of the expenses for the operation and maintenance of such systems during that year.

The population and area in acres served by the systems, as shown in the table, are of necessity in all cases estimates. These estimates for some cities are much more accurate than for others. In those with a compact area and well-developed system, the estimates are easy to make and practically correct. Such is the case in Detroit, Mich. In Minneapolis, Minn., on the other hand, only about one-half of the area of the city has sewers, and estimates for that city are subject to considerable error.

The mileage shown in Table 1 is that of the main, lateral, intercepting, and outfall sewers, and sewers from the pumping stations and sewage purification works to final outlets, but is exclusive of the mileage of house and catch-basin connections. The sewers are classified according to character of the waste which they are designed to convey, whether sewage only, or sewage and storm water, or the two combined; and also according to the material of which constructed. Other classifications of the sewers would doubtless be of value to sewer engineers, such as those into main and lateral sewers, and according to size and shape of sewers, the former possible classification being perhaps the more significant; but so imperfect are the physical records of many cities with respect to sewers that it was believed to be impossible to obtain for a sufficient number of cities reliable information for either of the classifications mentioned. Sewers classified by character are of three general types, known as the sanitary, the combined, and the storm water. *Sanitary sewers* are those designed to carry only sewage or house waste, *combined sewers* are those designed to carry both sewage and storm or surface water, and *storm-water sewers* are those constructed to convey storm or surface water only.

Increase in sewer mileage: 1907–1909.—In 1907 the Bureau of the Census collected statistics on the mileage of sewers of each of these classes in the same 158 cities as those included in this table. In the following comparative statement is shown the total reported mileage of each of these classes of sewers in these cities at the close of the years 1909 and 1907, and the percentage of increase of each class:

YEAR, ETC.	MILEAGE OF SEWERS.			
	Total.	Sanitary.	Combined.	Storm water.
1909	24,971.9	5,258.3	18,361.5	1,352.1
1907	22,806.4	4,563.2	17,122.8	1,180.4
Increase	2,105.5	695.1	1,238.7	171.7
Per cent increase	9.2	15.2	7.2	14.5

Between the close of 1907 and that of 1909 the reported mileage of both sanitary and storm-water sewers increased relatively faster than the mileage of combined sewers. That greater increase was occasioned (1) by several cities providing for the purification of their sewage and building both sanitary and storm-water sewers to assist in its economical purification, and (2) by some of the western cities with light rainfall constructing only sanitary sewers.

Attention is here called to a number of striking differences in the mileage of the three classes of sewers as reported to the Bureau of the Census for the years 1909 and 1907. The reports for 12 cities showed at least 20 miles more of sanitary sewers in 1909 than in 1907, and for 6 cities showed 20 miles less of such sewers in the latter than in the former years. The mileage of the different classes of sewers as reported to the Bureau of the Census for these 18 cities is given in the table which follows, in which the 12 cities first referred to above are listed before the other 6.

City number.	CITY.	MILEAGE OF SEWERS.											
		All sewers.			Sanitary sewers.			Combined sewers.			Storm-water sewers.		
		1909	1907	Difference.[1]	1909	1907	Difference.[1]	1909	1907	Difference.[1]	1909	1907	Difference.[1]
1	New York, N. Y	1,907.9	1,834.2	+73.7	146.8	92.6	+54.2	1,738.7	1,729.2	+9.5	22.4	12.4	+10.0
15	New Orleans, La	425.0	420.0	+5.0	325.6	270.0	+55.6	....	....	....	99.4	150.0	−50.6
16	Washington, D. C	543.4	521.2	+22.2	46.7	22.7	+24.0	496.7	495.6	+1.1	....	2.9	−2.9
18	Los Angeles, Cal	439.0	304.0	+135.0	418.6	283.6	+135.0	....	....	....	20.4	20.4	....
27	Denver, Colo	429.3	364.9	+64.4	334.0	282.7	+51.3	3.6	3.6	....	91.7	78.6	+13.1
39	Memphis, Tenn	277.2	249.9	+27.3	277.2	249.9	+27.3	....	....	....	....	....	....
52	Trenton, N. J	91.3	70.2	+21.1	64.8	42.0	+22.8	15.2	21.0	−5.8	11.3	7.2	+4.1
57	Salt Lake City, Utah	124.7	78.0	+46.7	124.2	78.0	+46.2	....	....	....	0.5	....	+0.5
66	Tacoma, Wash	202.8	149.1	+53.7	173.9	132.0	+41.9	....	....	....	28.9	17.1	+29.1
69	Houston, Tex	63.2	53.0	+10.2	48.6	15.0	+33.6	6.5	30.0	+23.5	8.1	8.0	+0.1
97	Oklahoma City, Okla	145.6	84.8	+60.8	92.1	52.0	+40.1	4.5	3.9	+0.6	49.0	28.9	+20.1
108	Wichita, Kans	126.4	67.1	+59.3	94.0	....	+94.0	....	63.8	−63.8	32.4	3.3	+29.1
24	Providence, R. I	228.6	219.2	+9.4	....	28.4	−28.4	217.8	180.7	+37.1	10.8	10.1	+0.7
40	Richmond, Va	106.8	100.0	+6.8	1.0	100.0	−99.0	105.8	....	+105.8	....	....	....
82	Fort Worth, Tex	119.0	160.0	−41.0	115.0	158.0	−43.0	....	....	....	4.0	2.0	+2.0
128	Davenport, Iowa	71.6	69.7	+1.9	....	68.5	−68.5	69.5	....	+69.5	2.1	1.2	+0.9
144	Quincy, Ill	34.7	32.0	+2.7	....	32.0	−32.0	32.2	....	+32.2	2.5	....	+2.5
154	Chelsea, Mass	37.3	37.3	....	....	35.5	−35.5	35.5	....	+35.5	1.8	1.8	....

[1] Increase marked by (+) and decrease by (−).

The decrease in the reported mileage of sanitary sewers and of all sewers in Fort Worth, Tex., represents an error in the figures reported to the Bureau of the Census in 1907. The decrease in the reported mileage of sanitary sewers shown for other cities and the apparent increase shown for some others were doubtless due to errors in the local classification of sewers in 1907. The decreases in the mileage of storm-water sewers shown in the comparative statement for New Orleans, La., and the corresponding decrease for Montgomery, Ala., not shown in the statement was due to the incorrect reporting in 1907 of some open drains as storm-water sewers. These errors in the 1907 report have been corrected in the present one and some progress made toward correct comparative figures as between the several cities. But with imperfect local reports it is still probable that this report contains a number of minor errors similar to those noted above.

Sewers classified by construction material.—The classification in Table 1 of sewers according to the material of which constructed, is more detailed than in the reports of 1903, 1905, and 1907. Each of the classes shown in the table for the preceding years included two or more of the classes shown in Table 1 of this report. Thus the class of "brick" sewers reported for 1907 included all the "brick" and "brick and stone" sewers and some of the "brick and concrete" sewers separately reported for 1909. By reason of these changes in classification comparisons of the 1909 mileage of the different classes of sewers with that reported for 1907 are valueless.

In the collection of data for the 1909 report but few instructions were given to census agents as to the classification of sewers according to material of which constructed when built of different combinations of materials, it being thought safer to allow the city engineers to make their own classification than to attempt to make one for them. Under these circumstances it is possible that some engineers have reported stone sewers with a brick invert as "stone" while others have reported the same type of sewer as "brick and stone." It is also possible that some city engineers have reported sewers constructed in part of brick and in part of concrete as "brick and concrete," and that others have reported them either as "concrete" or "reinforced concrete." But with all these possible variations in engineers' reports it is doubtful if other instructions to the census agents would have secured results of greater usefulness or correctness.

A classification of the different kinds of sewers included under the heading "All other" in Table 1 is shown in the following table:

City number.	CITY.	MILEAGE OF SEWERS CLASSIFIED AS "ALL OTHER" IN TABLE 1.				
		Total.	Iron.	Wood.	Not reported.	All other.
	Total	201.9	35.8	39.0	80.6	46.5
1	New York, N. Y	1.4	1.0	0.4	......	......
5	Boston, Mass	26.7	......	......	26.7	......
6	Baltimore, Md	3.6	3.6	......	......	......
7	Cleveland, Ohio	39.8	1.5	(1)	38.3	......
10	Buffalo, N. Y	1.6	1.6	......	......	......
11	San Francisco, Cal	3.1	......	3.1	......	......
15	New Orleans, La	24.4	......	24.4	......	......
16	Washington, D. C	0.9	0.9	......	......	......
17	Minneapolis, Minn	6.3	......	......	......	6.3
18	Los Angeles, Cal	0.3	......	......	......	0.3
19	Jersey City, N. J	7.0	2.9	......	......	4.1
25	Rochester, N. Y	0.2	0.2	......	......	......
26	St. Paul, Minn	26.4	1.0	......	......	25.4
28	Portland, Oreg	0.2	......	0.2	......	......
30	Toledo, Ohio	0.1	0.1	......	......	......
33	Syracuse, N. Y	3.0	......	......	......	3.0
34	New Haven, Conn	0.3	......	......	0.3	......
35	Scranton, Pa	0.2	0.2	......	......	......
36	Paterson, N. J	0.1	0.1	......	......	......
38	Fall River, Mass	0.5	0.5	......	......	......
42	Grand Rapids, Mich	0.4	0.4	......	......	......
45	Cambridge, Mass	6.5	......	......	......	6.5
47	Albany, N. Y	0.5	0.3	......	0.2	......
50	Hartford, Conn	2.0	2.0	......	......	......
51	Reading, Pa	14.0	......	......	14.0	......
52	Trenton, N. J	0.6	0.6	......	......	......
54	New Bedford, Mass	0.3	0.3	......	......	......
57	Salt Lake City, Utah	0.9	(1)	0.9	......	......
58	Lynn, Mass	0.3	......	0.3	......	......
59	Wilmington, Del	0.3	0.3	......	......	......
60	Springfield, Mass	0.2	......	0.2	......	......
62	Lawrence, Mass	0.2	......	......	......	0.2
65	Yonkers, N. Y	1.3	1.2	0.1	......	......
68	Duluth, Minn	1.0	1.0	......	......	......
69	Houston, Tex	5.8	4.8	1.0	......	......
70	Somerville, Mass	(1)	......	......	(1)	......
72	Utica, N. Y	1.5	0.5	0.3	0.7	......
73	Waterbury, Conn	0.3	0.3	......	......	......
75	Schenectady, N. Y	0.4	0.4	......	......	......
76	Hoboken, N. J	3.2	0.1	3.1	......	......
77	Manchester, N. H	0.2	0.1	......	......	0.1
81	Norfolk, Va	0.2	0.2	......	......	......
85	Savannah, Ga	0.8	0.8	......	......	......
87	Harrisburg, Pa	1.3	0.9	......	0.4	......
90	Portland, Me	2.7	......	2.7	......	......
93	Holyoke, Mass	1.0	1.0	......	......	......
94	Brockton, Mass	1.9	1.9	......	......	......
98	Bayonne, N. J	1.0	1.0	......	......	......
101	Passaic, N. J	0.5	0.5	......	......	......
104	Allentown, Pa	0.4	......	......	......	0.4
106	Saginaw, Mich	0.1	(1)	0.1	......	......
112	Sioux City, Iowa	0.1	0.1	......	......	......
116	Bay City, Mich	0.8	......	0.8	......	......
125	Pueblo, Colo	0.2	......	......	......	0.2
126	Salem, Mass	3.7	2.5	1.2	......	......
128	Davenport, Iowa	0.1	0.1	......	......	......
136	Chester, Pa	0.2	0.2	......	......	......
153	Oshkosh, Wis	0.7	0.5	0.2	......	......
157	Newport, Ky	0.2	0.2	......	......	......

[1] Less than one-tenth of 1 mile.

In the column headed "Vitrified pipe" is included the mileage of all burned clay-pipe sewers, whether designated by city engineers as "terra cotta," "vitrified pipe," or bearing some other designation. Most of the sewers tabulated in the column mentioned are less than 24 inches in diameter. Glazed terra-cotta or vitrified pipe is ordinarily used for all sewers under this size, and also to a considerable extent in the 30 and 36 inch sizes, where the sewers are laid in wet ground and there is danger of infiltration. Cement and concrete are also used, but less generally for these smaller sewers.

The sewers reported in the column headed "All other" in the foregoing table were of the following character in the cities named: Minneapolis and St. Paul, Minn., sand-rock tunnels; Los Angeles, Cal., and Cambridge, Mass., iron and wood; Jersey City, N. J., and Manchester, N. H., steel; Syracuse, N. Y., web tile; Lawrence, Mass., concrete invert, ledge roof; Allentown, Pa., stone and concrete; and Pueblo, Colo., slag faced with cement pipe.

Special attention should be called to the sand-rock tunnels of Minneapolis and St. Paul. These were constructed in a stratum of soft sand rock, and are of varying height and width. In Minneapolis the tunnels are always lined with brick. In St. Paul the natural stone usually forms the roof and walls of the sewer, though in some places the character of the stone requires a brick lining for a short distance. The invert is always built of brick.

Manholes.—Manholes, as the name implies, are built to allow access to the sewers for the purpose of inspection and cleaning. In the case of lateral sewers they are generally nearer together than on main sewers, and their location is governed by the requirements of the alignment and grade. For several cities no report could be obtained of the number of manholes. In cities reporting manholes the number per mile of sewers varied from 1.9 for Dallas, Tex., to 56 for Joliet, Ill.

Catch basins.—In combined and storm-water sewers provision is made for allowing water from the street gutters to pass into the sewers. These places in the gutters are usually termed inlets, and may be provided with gratings or coarse screens to keep weeds and other large floating matter from entering the sewers. Provision is usually made for the water before it flows into the sewers to pass through a catch basin or pit in which the soil or street dirt in the storm water may be caught and prevented from entering the sewers. The number of catch basins in such cases is not necessarily the same as the number of inlets, inasmuch as the matter from several inlets may flow to the same catch basin.

In the systems of some cities no catch basins are provided, the water flowing directly from the inlet to the sewer. Many engineers of to-day hold that in sewers with a considerable grade which discharge into deep water, the basins are unnecessary, as any material passing through the inlet grating will be carried to the outlet. The sewer system of Minneapolis is constructed in accordance with this theory. For this city, however, and presumably for others, the inlets have been reported as catch basins, even though there is no basin in which the storm water can settle. In Table 1 the number of catch basins reported is shown, and also the number per mile of sewers.

Ventilation.—In most American cities sewers are ventilated through manholes, the covers of which are perforated for that purpose. Some cities in 1909 had means of ventilating their sewers other than through manholes, or in addition to them. The cities and the means employed by them were as follows:

Ventilating sewers through manholes and house connections:

Chicago, Ill.
Cleveland, Ohio.
Los Angeles, Cal.
Denver, Colo.
Syracuse, N. Y.
Omaha, Nebr.
Memphis, Tenn.
Nashville, Tenn.
Dallas, Tex.[1]
Salt Lake City, Utah.
Wilmington, Del.
Springfield, Mass.[2]
Houston, Tex.
Birmingham, Ala.
Savannah, Ga.
Terre Haute, Ind.
Brockton, Mass.
Covington, Ky.
Little Rock, Ark.
Haverhill, Mass.
Dubuque, Iowa.
Montgomery, Ala.
Charleston, S. C.
Bay City, Mich.
Jacksonville, Fla.
Lincoln, Nebr.
Fitchburg, Mass.

Ventilating sewers through manholes and catch basins.

Washington, D. C.
Louisville, Ky.
Oakland, Cal.
Camden, N. J.
Oklahoma City, Okla.
Sacramento, Cal.
Pueblo, Colo.
Davenport, Iowa.
Superior, Wis.
Newton, Mass.
Auburn, N. Y.

Ventilating sewers through inlets:

Evansville, Ind.
Allentown, Pa.
Saginaw, Mich.
Springfield, Ill.

Ventilating sewers by sundry means:

San Francisco, Cal	Manholes and cesspools.
New Orleans, La	House connections and trap ventilators.
Cambridge, Mass	Manholes and airshaft in elevated part of city.
Rockford, Ill	Lamp holes and manholes.
Augusta, Ga	Catch basins and bell trap at house.
Woonsocket, R. I	Manholes and curb vents.
Racine, Wis	Catch-basin vents.
La Crosse, Wis	Catch-basin vents.

Inverted siphons and siphons.—In constructing a sewer system it is sometimes necessary to carry a sewer down one side of and across a valley and up the other side. When this is done there is formed what is known as an "inverted siphon," though there is in reality nothing about it involving the principle of the siphon. Inverted siphons are very common in sewer systems, being reported by 46 of the 158 cities included in this report. A few siphons are met with in the sewer systems. They are constructed to avoid excessive cuttings. An excellent example of a true siphon has been constructed in Norfolk, Va.

Storm-water overflows.—In combined sewer systems provision is often made at different points in the system for the discharge of the sewer contents into a natural stream during a storm. This is accomplished in one of three ways, namely, by a so-called leaping weir, by an overflow weir, or by a mechanical regulator. In the investigation accompanying the collection of these statistics no attempt was made to differentiate between the different kinds of storm-water overflows, and only the total number of such overflows reported by the different cities is shown in Table 1.

Distance from sewer outlet to nearest waterworks intake.—The cities having a population of over 30,000 which discharge their sewage into rivers above where other cities or towns derive their water supply are given in the statement which follows. The figures after the name of each city state the number of miles between the sewer outlet and the nearest downstream waterworks intake:

City number.	CITY.	Miles.	City number.	CITY.	Miles.
1	New York, N. Y. (Borough of Bronx)	20	83	Wilkes-Barre, Pa	100
4	St. Louis, Mo	60	86	Peoria, Ill	10
9	Detroit, Mich	5	91	Terre Haute, Ind	80
10	Buffalo, N. Y	12	92	East St. Louis, Ill	1
12	Cincinnati, Ohio	26	97	Oklahoma City, Okla	25
20	Kansas City, Mo	10	104	Allentown, Pa	4
22	Louisville, Ky	5	112	Sioux City, Iowa	100
25	Rochester, N. Y	(1)	113	Little Rock, Ark	90
37	Omaha, Nebr	18	116	Bay City, Mich	5
43	Nashville, Tenn	60	120	Chattanooga, Tenn	28
44	Lowell, Mass	10	125	Pueblo, Colo	42
47	Albany, N. Y	40	128	Davenport, Iowa	30
51	Reading, Pa	58	129	McKeesport, Pa	5
52	Trenton, N. J	10	130	Wheeling, W. Va	3
55	Camden, N. J	18	131	Augusta, Ga	150
63	St. Joseph, Mo	58	134	Dubuque, Iowa	22
64	Troy, N. Y	6	143	Elmira, N. Y	150
71	Kansas City, Kans	14	144	Quincy, Ill	22
72	Utica, N. Y	90	145	Knoxville, Tenn	186
75	Schenectady, N. Y	20	146	New Castle, Pa	20
77	Manchester, N. H	41	150	Joliet, Ill	50
78	Evansville, Ind	12	156	La Crosse, Wis	100

[1] Not reported.

The six cities located on the Great Lakes which discharge a portion or all of their sewage into those lakes, and the distance of each from the sewer outlet to the nearest waterworks intake, are as follows:

City number.	CITY.	Miles.	City number.	CITY.	Miles.
2	Chicago, Ill	3	132	Superior, Wis	3
7	Cleveland, Ohio	5	142	Racine, Wis	1
68	Duluth, Minn	3	153	Oshkosh, Wis	1

Cost, or replacement value, of sewer systems.—For several years the Bureau of the Census has endeavored to obtain from city officials statements of the replacement value of their sewer systems. The statements thus obtained for 1909 are shown in Table 1 in the column with the heading "Cost, or replacement value, of system." For some cities the column presents statements of the original costs of the systems, and for others, estimates of their present or replacement value.

---

[1] Also catch basins.

[2] Also well holes.

Statements of the original costs were obtained principally from cities which have recently installed sewer systems, and as a rule they are the most accurate of those shown in the table.

Sewer statistics of Table 2.—Table 2 gives an analysis according to construction material of the mileage of the three different kinds of sewers shown in Table 1. The analysis by construction material is not given in quite so much detail as in Table 1; yet it is believed that it is as detailed as would be of any practical value to engineers. With "brick" sewers are included all sewers reported as being constructed of "brick," "brick and concrete," and "brick and stone." In some of these brick and concrete sewers the brick forms the invert of the sewer ring; in others, the arch; and in the others, the entire lining. In the columns showing the mileage of concrete sewers is included the mileage of both the plain and the reinforced concrete sewers. It will be noted that although most of the mileage of all three kinds of sewers was of vitrified pipe, sewers constructed of such material formed a larger proportion of the total mileage of the sanitary sewers than of either of the other kinds, while the proportion of brick sewers was largest in the combined type.

Sewers built during the year.—In Table 3 is shown the mileage of each of the three different kinds of sewers built during 1909, together with the mileage of each kind built by city employees and that built by contractors, these two classes being further subdivided according to construction material. Thirty-nine cities used city employees in the construction of sewers in 1909. In some of these cities the entire work of construction was performed by city employees, while in others it was performed in part by city employees and in part by contractors. Most of the sewers built by city employees were small vitrified-pipe sewers.

Methods of financing sewer construction.—In many cities the costs of constructing sewers are paid in large part by special assessments levied upon the property owners directly benefited by the sewers. The principle governing this practice is that as the value of the property is increased in consequence of the installation of the sewer, the owner of the property should pay a proportion of the cost of construction. Many cities are divided into sewer districts, and the costs of building sewers in such districts are met by levies of general property taxes upon all of the property of the district. The methods of financing the construction costs of sewers in the 140 cities from which reports were received were as follows:

MAINE:

Portland.—The city pays one-third of the cost from its general revenues. The remaining two-thirds is paid by the owners of abutting property previous to making connection with the sewer.

NEW HAMPSHIRE:

Manchester.—General property tax.

MASSACHUSETTS:

Boston.—Special assessment rates for the construction of sanitary sewers are fixed by the board of street commissioners according to frontage available, available building space, nature and grade of the land, prior assessments and use of the land, provided, however, that the rates assessed shall not exceed $4 per linear foot of sewer built. Vacant lots are not assessed, but when developed, an entrance fee, or fee for making connection with the sewer, is collected of 2 cents per square foot of land drained up to a depth of 100 feet.

Worcester.—Special assessment in part, but with no fixed rate. Average is $1 to $1.25 per front foot on each side of sewer location.

Fall River.—General property tax.

Lowell.—One-half of cost paid by city from general revenues, and one-half is assessed against abutting property.

Cambridge.—Uniform assessment rate, irrespective of cost of sewers. Twenty-eight cents per front foot and 5.2 mills per square foot of area of lot up to a depth of 100 feet; balance, by bond issues.

New Bedford.—Fifty per cent of the total cost, not including street intersections, is assessed against owners of abutting property. Method of assessment not reported.

Springfield.—Special assessment of $25 per tenement on ground floor of dwellings. For business blocks one story in height, 1 cent per square foot of area covered by building, and for business blocks two or more stories in height, 1¾ cents per square foot of area covered by building.

Lawrence.—Special assessment of 6½ mills per square foot to a depth of 100 feet from street line. Corner lots are assessed for only one side.

Somerville.—Special assessment based on frontage and area of lot not exceeding 100 feet in depth, and at a rate not exceeding 50 cents per front foot and 5 mills per square foot of area.

Holyoke.—About two-thirds of cost assessed upon abutting property owners, according to frontage and area. Rate, 8 cents per front foot, plus 5 mills per square foot.

Brockton.—Special assessment of 15 cents per front foot and 3 mills per square foot of property to depth of 125 feet.

Haverhill.—Approximately 35 per cent of toal cost assessed by municipal council on abutting property at the rate of 20 cents per front foot and 4 mills per square foot of area within 150 feet of street line.

Salem.—Rate, 50 cents per front foot on abutting property.

Newton.—Special assessment of 15 cents per front foot and 5½ mills per square foot of area within 180 feet of street line.

Fitchburg.—For property within the so-called sewer district an assessment is levied of from 54 to 84 cents per front foot, according to the cost of the work; outside the limits of the sewer district, three-fourths of the cost is levied on abutting property.

Taunton.—Special assessment of 20 cents per front foot and 2$\frac{4}{10}$ mills per square foot of area, to the depth of 125 feet.

Everett.—Special assessment of $1 per linear foot of sewer, which covers about one-third the cost of construction.

Chelsea.—Three-fourths of the total cost for new sewers is assessed against the adjoining property, the assessment being based on the area of the lots. The assessments range from $3 to $8 per 1,000 square feet.

RHODE ISLAND:

Providence.—Special assessment of 1 cent per square foot of area of property served, and 60 cents per front foot. If this does not cover expense, the balance is paid from general revenues.

Pawtucket.—Special assessment of 25 cents per front foot and 5 mills per square foot of each lot.

Woonsocket.—Special assessment of 25 cents per front foot and 7½ mills per square foot of lots to a depth of 120 feet.

CONNECTICUT:

Bridgeport.—Property owners are assessed three-fourths of the total cost of construction, the rates of assessment ranging from 20 to 50 cents per front foot.

Hartford.—Abutting property is assessed for the entire cost of sewer, in proportion to frontage; the average rate of assessment is $1.25 per front foot.

Waterbury.—Special assessment of $1.50 per front foot of abutting property.

New Britain.—Special assessment based on frontage, and varies from $1.25 to $1.75 per front foot.

NEW YORK:

New York.—Special assessment upon abutting property.

Buffalo.—Total cost levied against property owners on front-foot basis, excepting cost of trunk sewers, which is met from general funds of city.

Rochester.—Entire cost of laterals assessed against property benefited per front foot. Entire cost of trunk sewers assessed against all property in the sewer district in proportion to frontage.

Syracuse.—Total cost assessed against property benefited.

Albany.—Total cost assessed against property benefited.

Troy.—Total cost of sewers under 24 inches in diameter is assessed against benefited property. One-half of the cost of sewers 24 inches and larger is paid by the city, the other half by special assessments against benefited property in proportion to frontage.

Yonkers.—Special assessment in proportion to area.

Utica.—Sanitary sewers are generally paid for by special assessment on frontage basis.

Binghamton.—Special assessment of 80 cents per front foot of property.

Elmira.—General property tax.

Auburn.—Property abutting on line of lateral sewers is assessed per front foot for entire cost, assessments being payable in 10 annual installments. Assessments for trunk sewers are apportioned on all properties in district drained.

NEW JERSEY:

Newark.—Cost is prorated on front-foot basis on property benefited by board of estimate and assessment commissioners, which has discretionary power to apportion lower rates on property already assessed for sewer on adjoining street.

Jersey City.—Entire cost assessed against abutting property on frontage basis.

Paterson.—Assessments made by board of assessors on frontage basis, according to cost of building sewer. Rate determined by dividing the total cost of sewer by number of linear feet constructed.

Trenton.—Special assessments in accordance with benefits derived.

Camden.—Special assessments according to frontage.

Elizabeth.—Special assessments on property according to frontage.

Hoboken.—About $125 per lot, 25 by 100 feet, which includes all assessments.

Bayonne.—Assessments made on basis of frontage.

Passaic.—Special assessment according to benefit derived; no fixed rate.

West Hoboken.—Special assessment for sewers of about $200 per lot of 25 feet frontage.

PENNSYLVANIA:

Philadelphia.—Property owners pay $1.50 per front foot (irrespective of cost of construction) toward the cost of constructing sewers in front of their properties.

Pittsburgh.—Cost, damage, and expense of constructing sewers assessed against properties specially benefited.

Scranton.—Total or portion of cost of sewers assessed against property benefited; no fixed rate of assessment.

PENNSYLVANIA—Continued.

Reading.—Special assessment based on frontage of property.

Erie.—Assessments made against abutting property by prorating cost on basis of the ratio of the front-foot measurements of property to total length of sewers.

Harrisburg.—Special assessments fixed according to cost of work per block.

Johnstown.—General property tax.

Altoona.—Property owners whose estates are benefited are assessed for full cost of sewer, prorated on basis of number of linear feet of each estate fronting on line of sewer.

Allentown.—General property tax.

Lancaster.—Entire cost met by assessment on frontage of abutting property at $25 for each 33 feet frontage.

York.—General property tax.

McKeesport.—Storm or surface water sewers, from council appropriations exclusively at city expense. Combined sewers, assessment not to exceed $1.60 per front foot.

Chester.—Special assessments on a frontage basis.

New Castle.—Cost of sewer assessed against abutting property on frontage basis.

DELAWARE:

Wilmington.—Special assessment of 50 cents per front foot and 1 cent per square foot of area of lots which abut on line of sewer.

DISTRICT OF COLUMBIA:

Washington.—Special assessment of $1 per front foot for house service sewer, payable in three annual installments.

VIRGINIA:

Richmond.—Special assessment for house connections only. Sewers are built at city's expense. An annual assessment of 10 cents per front foot is levied upon the abutting property. This assessment may be commuted by the payment of $1.50 per front foot.

Norfolk.—General property tax.

WEST VIRGINIA:

Wheeling.—General property tax.

SOUTH CAROLINA:

Charleston.—General property tax.

GEORGIA:

Atlanta.—The abutting property owners are assessed 70 cents per front foot, the city paying the remainder from general revenue.

Savannah.—General property tax.

Augusta.—Special assessment of 25 cents per front foot; the remainder of cost from general revenue.

FLORIDA:

Jacksonville.—General property tax.

OHIO:

Cleveland.—Cost met in large part by special assessments on abutting property at a rate not exceeding $2 per front foot. Any excess is borne by city from general taxes.

Cincinnati.—Owners of abutting property pay 98 per cent of cost of construction, not exceeding $2 per front foot, the excess being paid from general treasury.

Columbus.—The cost of building sanitary sewers is apportioned to properties benefited on front-foot basis; that of other sewers is met from bond issues.

Toledo.—Cost of sewers is assessed on abutting property. Street intersections are paid for by city.

Dayton.—Storm sewers are paid for from tax levy funds and by bond issues; sanitary sewers from special assessments on property benefited, as apportioned by special committee of city council.

Youngstown.—The city pays 2 per cent and the owners of abutting property 98 per cent of the cost of sewers, aside from intersections, which are paid for entirely by the city.

Akron.—Property holders pay 98 per cent of the cost and the city pays 2 per cent of it, together with the total cost of intersections. Assessments made according to frontage on street.

Ohio—Continued.

Springfield.—Ninety-eight per cent of the total cost is paid by special assessments levied upon abutting property according to frontage. The city pays the remaining 2 per cent of cost.

Indiana:

Indianapolis.—Total cost assessed upon abutting property, according to area benefited.

Evansville.—City pays one-third and property owners two-thirds of cost of main sewers. Property owners' share is paid by assessments collected by city for contractors and owners of bonds. Local sewers are paid for entirely by assessments levied upon property owners according to area of lot.

Fort Wayne.—Total cost of construction of sewers assessed against abutting property.

Terre Haute.—General property tax.

Illinois:

Chicago.—Property benefited is assessed for the entire cost. Rate variable. In business sections the rate is based on area of lot, while in the residential section it is based on the frontage and depth of lot, corner lots paying one-fifth more than inside lots.

Peoria.—Abutting property is assessed for total cost of sewer construction, according to area of lots benefited.

East St. Louis.—Total cost of construction assessed against abutting property on basis of frontage.

Springfield.—Eighty per cent of cost is met by special assessment levied against property directly benefited, and 20 per cent is borne by the city at large.

Rockford.—Special assessment based on frontage.

Michigan:

Detroit.—Cost of trunk sewers and of street intersections of lateral sewer paid from general revenues; balance is assessed against abutting property, according to area served.

Grand Rapids.—Cost assessed against property benefited, according to area served, the number of connections made, or that can be made in future, and the estimated benefit resulting from the sewer.

Saginaw.—Cost of trunk sewers paid by city at large. Cost of lateral sewers assessed against property benefited.

Bay City.—Cost met by special assessments against property benefited, according to area of lots.

Kalamazoo.—Forty-five per cent of cost assessed on frontage basis against property benefited.

Wisconsin:

Milwaukee.—Special assessment not to exceed 80 cents per front foot on abutting property, a reduction of 33⅓ per cent being made on corner lots. City pays for intersections.

Superior.—Special assessment on property according to frontage. Cost for 1909, about $1.25 per front foot.

Racine.—Special assessment of 60 cents per front foot against property benefited. Balance is paid out of general revenues.

Oshkosh.—Special assessment upon property at the rate of 40 cents per front foot. Balance paid by city.

La Crosse.—Special assessment upon property at the rate of 80 cents per front foot. All over that paid out of general revenue.

Minnesota:

Minneapolis.—Special assessment upon property benefited at a rate not exceeding $1.50 per front foot. Corner lots of more than 100 feet frontage on one side, on which an assessment has been paid, pay no assessment on a maximum of 66 feet front when a sewer is laid along the other side of lot.

St. Paul.—Total cost of sewer, as determined by board of public works, is assessed against property benefited, according to frontage, provided that the assessment shall not exceed 25 per cent of the assessed value of the entire property benefited.

Duluth.—By special assessment according to frontage.

Iowa:

Des Moines.—Cost of sewer assessed against abutting and adjacent property benefited, on a frontage basis, provided that the assessment shall not exceed 25 per cent of actual value of property.

Sioux City.—Special assessment against property benefited. Assessments average about $25 to $30 for a 50-foot lot.

Davenport.—Special assessment based on area of benefited property.

Dubuque.—Cost of storm sewers is met by general taxation. Cost of sanitary sewers is assessed on adjacent proporty according to frontage.

Missouri:

St. Louis.—Cost of large outlet and main trunk sewers is met from general revenue or from bond issue. Cost of secondary trunk and lateral sewers is met by special assessments against property in sewer district in proportion to area of property benefited.

Kansas City.—Special assessment based on number of square feet in the property benefited.

St. Joseph.—Cost of main trunk sewers met from proceeds of bond sales by city. All property within boundaries of each sewer district (as laid out by city engineer) is assessed for lateral sewers constructed therein upon the basis of the number of square feet in each piece of property.

Joplin.—General taxation for public or trunk sewers. Special assessments against property benefited for lateral sewers.

Nebraska:

Omaha.—The entire cost is assessed against property benefited, in proportion to frontage.

Kansas:

Kansas City.—Sewers constructed by organized districts, and the cost assessed against the property benefited, in proportion to the value of the land exclusive of improvements and as determined by special appraisers appointed for the purpose.

Wichita.—Property assessed for entire cost on the basis of the area of property benefited.

Kentucky:

Louisville.—General property tax.

Newport.—Cost of sewers met from proceeds of special assessment bonds running 20 years at 6 per cent interest. One-twentieth of the bonds are retired annually.

Tennessee:

Memphis.—General property tax.

Nashville.—General property tax.

Chattanooga.—General property tax.

Knoxville.—Some are built under "abutting property law," property owners paying two-thirds of the cost exclusive of the cost of intersection, which is paid for by city.

Alabama:

Birmingham.—One-half of cost assessed against property benefited.

Mobile.—General property tax.

Montgomery.—Cost assessed against abutting property, according to frontage.

Louisiana:

New Orleans.—General property tax.

Texas:

San Antonio.—Sewers in one sewer district are paid for by special assessment upon property on frontage basis—$35 per lot up to 55 feet frontage. No record for larger lots. Sewers in another district are paid for by the proceeds of special assessment bonds to be redeemed from the proceeds of special assessment levied at the rate of 25 cents per $100 valuation of property within district benefited.

Dallas.—General property tax.

Houston.—General property tax.

Fort Worth.—General property tax.

Galveston.—General property tax.

OKLAHOMA:

Oklahoma City.—Cost of all trunk sewers met from bond issues. Cost of lateral and district sewers assessed against abutting property according to area drained.

ARKANSAS:

Little Rock.—City divided into sewer districts. Each district has an assessor and each assessment for sewer construction is based on the value of the property benefited.

MONTANA:

Butte.—Sanitary sewers paid for by special assessment apportioned on frontage basis. Storm sewers paid from bonds issued and general city revenue.

COLORADO:

Denver.—Assessment based on area of lot.

Pueblo.—Cost exclusive of sewers at street intersections assessed upon abutting property on basis of frontage

UTAH:

Salt Lake City.—Special assessments payable in five annual installments for construction of lateral sewers. Main sewers paid from general bond issue.

WASHINGTON:

Seattle.—Entire cost of lateral sewers assessed against abutting property. Average rate of assessment $1.75 per front foot. Main sewers paid for partly by assessment on area drained and partly by issue of sewer bonds of city.

Spokane.—One-half of cost of sewers met from tax levies in the local improvement district in which the sewer is built, and one-half assessed against the property fronting upon the street in which the sewer is built, on a front-foot basis. Rate of assessment varies with the size of the sewer.

Tacoma.—Sanitary sewers paid for by special assessments levied in local improvement districts. Storm sewers paid for from issues of general city bonds.

OREGON:

Portland.—Cost of trunk sewers met from tax levies in sewer district in which the sewer is constructed; cost of lateral sewers assessed against abutting property.

CALIFORNIA:

San Francisco.—Special assessment based on frontage.

Sacramento.—Cost of sewers met in part from special assessment upon abutting property.

Charges or special assessments for sewer maintenance.—But few cities collect any special compensation from those using their sewers, or levy any special assessment for meeting the costs of their operation and maintenance. To this general rule there are, however, a few exceptions. Brockton, Mass., levies a quarterly charge for the maintenance of its sewer system of 15 cents per 100 cubic feet of water entering the sewer from private establishments; and in Taunton, Mass., two-thirds of the cost of operating and maintaining the sewers is met from so-called sewer rentals or charges, and one-third from general taxation.

Operation and maintenance of sewer systems.—Table 4 presents data relating to the employees and expenses of the operation and maintenance of sewer systems. The table is arranged in two parts, the first presenting data for cities in which no city employees are engaged for any part of the time upon construction work, and the second presenting data for cities in which some or all of such employees are engaged for a part of their time upon sewer construction work. The table gives the average number of employees in the different cities engaged in the operation and maintenance of sewer systems, and, for cities where statistics are shown in Part I, the average number of such employees per 10 miles of sewer and per 10,000 inhabitants served. The table also shows for all cities covered by the report the expenses of operating and maintaining the sewer systems for 1909. The table contains no mention of Atlantic City, N. J., or York, Pa., since the sewer system of the former city was owned by a private corporation, while that of the latter was not in use in 1909, the city having been forbidden by the courts to discharge crude sewage into the stream to which the sewers were graded.

For this investigation no special analytical study of the expense of operating and maintaining sewers was attempted. The Bureau of the Census collects each year from cities having a population of over 30,000 statistics of the expense of maintaining different governmental activities. The payments for expenses shown in Table 4 are the amounts of money reported as paid for care of sewers and for sewage disposal. The cost of pumping and purifying sewage in cities where this is practiced often forms a large proportion of the total costs of operating the sewer systems, and must be taken into consideration in any comparison of sewer expenditures between city and city. Cities pumping or purifying sewage are indicated by footnote to assist in the interpretation of the figures of the table. In like manner, the fact to which attention has been called on page 24 concerning the construction of sewers by employees of the city must be considered in comparing the number of employees with any other class of data presented in the tables.

The number of employees reported for the different cities is the average number employed during the year. The rule followed by agents of the Census Office in computing this average number was to add together the number of the different classes of employees appearing upon the pay rolls of the city at the middle of each month during the year, and to divide the sum by 12. Inasmuch as the number of persons engaged upon the maintenance of sewers may vary greatly from day to day, the results obtained are not, of course, strictly accurate, but it is believed that the averages obtained are approximately correct. In some cities the employees engaged in sewer work are employed for a part of the time upon work for some other department. In such cases it is impossible to obtain exact statistics as to the average number of men engaged upon either class of work. Where this is the case, attention has been called to the fact by a footnote appended to the table.

House connections.—Table 5 presents statistics of house connections, as the pipes are called which connect the sewer systems with the plumbing of buildings. The attempt was made in the investigation, the results of which are embodied in this report, to elicit information as to the number of buildings actually connected with the sewers, the length of connections, etc.; but the investigation developed the fact that many cities in their records and published reports use the term "house connections" as the designation for the branches or stems built from the sewers to the curb or building line by the city at the time the sewers were constructed. For such cities it is doubtless true that Table 5 states the number of such stems or branches instead of the actual number of connections of buildings with the sewer systems. Where this is known to be the case, attention is called to the fact in the table by a footnote.

The column in which are tabulated the number of connections at the close of the year illustrates the incompleteness in 1909 of the physical records of many cities with respect to their sewer systems. Very many cities reported only an estimate instead of the actual number of house connections, and not even an estimate could be obtained for 21 cities. No report was obtained for Atlantic City, N. J., or York, Pa., for reasons stated on page 27.

The figures in the column showing the miles of house connections at the close of the year are in nearly all cases estimates based upon the number of such connections multiplied by their estimated average length. The length in miles reported is in many cases only the aggregate length of the connections from the sewer to the curb line or the building line, while for Covington, Ky., and perhaps a few other cities, it is the distance from the curb line to the house.

All but 19 cities had records of or estimated the number of house connections that were made during the year. In many cities no house connections are made, except by permit granted by the city, and where this is the case the number made was definitely reported.

In most cities house connections from the street sewer to the cellar wall were made by licensed plumbers, drain layers, or sewer tappers, but in the 12 following cities city employees made the connections:

New Orleans, La.
Louisville, Ky.
Toledo, Ohio.
Syracuse, N. Y.
Memphis, Tenn.
New Bedford, Mass.
Brockton, Mass.
Jacksonville, Fla.
Saginaw, Mich.
Rockford, Ill.
Newton, Mass.
Taunton, Mass.

Contractors with the city made the connections in the 18 following cities:

Cleveland, Ohio.
San Francisco, Cal.
Los Angeles, Cal.
Indianapolis, Ind.
Grand Rapids, Mich.
Lowell, Mass.
Bridgeport, Conn.
Spokane, Wash.
Erie, Pa.
Peoria, Ill.
East St. Louis, Ill.
Holyoke, Mass.
New Britain, Conn.
Superior, Wis.
Fitchburg, Mass.
Racine, Wis.
Joliet, Ill.
Everett, Mass.

In Wilmington, Del., and Springfield, Mass., city employees made the connections from the main to the curb, and licensed plumbers from the curb to the house; contractors with the city made the connections from the main to the curb in Binghamton, N. Y., Hartford, Conn., and Springfield, Ohio, and licensed plumbers from the curb to the house; both contractors and licensed plumbers made connections in Chicago, Ill., St. Louis, Mo., and Wilkes-Barre, Pa.; and both city employees and contractors made connections in Richmond and Norfolk, Va. No information was secured with reference to this subject for Milwaukee, Oshkosh, and La Crosse, Wis.

Connections were made at the expense of the city in New Orleans, La., Indianapolis, Ind., Memphis, Tenn., and Erie, Pa. The city bore the expense of making connections from the main curb, and property owners from the curb to the house in the 6 following cities:

Wilmington, Del.
Springfield, Mass.
Norfolk, Va.
Saginaw, Mich.
Binghamton, N. Y.
Springfield, Ohio.

There was no record as to the distribution of this expense for Toledo, Ohio, and Schenectady, N. Y. In all cities other than those mentioned above the expense of making the connections was borne by the property owners.

For some cities the size of the pipe from the sewers to the curb was larger than that from the curb to the cellar wall.

Flushing of sewers.—The information that was obtained relating to the flushing of sewers is given in Table 6. From that table it can be seen that nearly every city flushed its sewers to a greater or less extent in order to keep them free from matter that might otherwise accumulate and cause stoppages. Some cities employ flushing so extensively that practically no cleaning is required; other cities flush sewers only when they have become partially clogged; and still others flush only in the case of actual stoppages, the stoppage being first removed. The last method is followed in Wheeling, W. Va.

All methods for the flushing of sewers call for the creation of a head of water. This head is most commonly secured by introducing considerable quantities of water into the sewers, either through the manholes or catch basins.

The most common method of flushing through the manholes or catch basins is by means of a hose attached to a fire or street-sprinkling hydrant. Some cities, however, instead of the hose employ an iron pipe running directly from a water main to the manhole, catch basin, or to a cistern so arranged that the sewer is flushed by turning a faucet. This method is called a "direct connection," and the number of such connections is shown in the table.

Another method is by means of automatic flush tanks, which are usually situated in manholes or catch basins, at or near the head of lateral sewers, and cause a small stream of water to flow continuously into the tank. Flush tanks of one type are so pivoted that when they become full of water they tip over automatically, discharge their contents, and swing back into position to be filled again; those of another type, filled in substantially the same way, discharge by siphonic action, the size of the stream which supplies the tank and the frequency of the flush being regulated by a valve in the pipe.

Other cities employ portable tanks, either alone or in addition to automatic ones. They are simply tanks placed upon wagon trucks, filled with water, hauled to the point of a sewer where flushing is desired, and tilted so that their contents are suddenly discharged into the manhole or catch basin.

In a few cities flushing is accomplished in certain portions of the sewer system by diverting water from natural streams into the sewers, and in the case of sanitary sewers by occasionally allowing storm water to enter them.

The mileage of sewers flushed, as shown in Table 6, was obtained in each case by multiplying the number of miles subject to flushing by the number of times flushed. When the data for such computation was not of record, estimates were secured where practicable. Such estimates as were made by the different cities are shown in the table.

Cleaning of sewers.—Table 6 shows the number of stoppages in the main and lateral sewers that were brought to the attention of city officials, the number of miles cleaned during the year, the method of cleaning, and the cost of cleaning per mile. The number of miles of sewers cleaned is the gross number of miles cleaned once, or the mileage that was cleaned on a unit basis. It will be noticed that a number of cities reported no cleaning aside from that accomplished by flushing. For several of these stoppages were reported, and it is probable that these stoppages were removed and the sewers afterwards flushed, no further cleaning being required. The amount of cleaning, as well as flushing, necessarily depends largely upon the character of the manufacturing waste entering the sewers and upon the grade of the system; for example, the sewers of Duluth, Minn., which have a high gradient, require practically no cleaning.

Cleaning of catch basins.—The catch basins tabulated in Table 6 are sometimes called "storm-water receiving basins." They are generally considered an integral part of the sewer system, and the cleaning of them is properly considered in connection with the cleaning of sewers. In most instances they are constructed with a sump and perform the function of the gravel catchment basins of some systems in arresting the sand and dirt carried by the surface water as it comes from the street.

In Table 6 are shown the total number of catch basins, the number cleaned during the year, the cubic yards of silt removed per basin per cleaning, and the number of specially constructed wagons used by the city in the removal of the silt. The number of cubic yards of cleanings removed, as shown by the table, represents the average quantity of material taken from each catch basin at each cleaning. The number of catch basins cleaned was not reported for several cities, and none were cleaned in Minneapolis, Minn., since the basins in that city are constructed without a sump, so that everything that is washed into the catch basin, with the exception of sticks and large objects, goes directly into the sewers.

Volume of sewage.—In the present investigation an attempt was made to obtain from the city officials in charge of sewers reports of the volume of sewage discharged. The results obtained and summarized in Table 7 show that only a few cities measure that volume, and hence the only statements to be obtained for most cities were estimates. Cities that pump or purify their sewage and those that make either weir or some other measurements of its flow are able to provide and have made fairly accurate statements of the discharge of their sewers, while for the large majority of cities whose statements were based on water consumption the figures given are less accurate.

The columns showing the discharge are headed "Average," "Maximum," and "Minimum." The capacity of the sewers was sometimes reported as their maximum discharge. In other cities, especially where the sewage was pumped, the maximum quantity pumped during any given day was reported as the maximum quantity discharged.

Included in the total volume of sewage is of course that of the factory wastes that enter the sewers, which in some cities is very much greater than in others.

Most cities would make no estimate of the quantity of factory wastes entering the sewers. The cities making such estimates and the character and quantities of the wastes entering the sewers are shown in the statement following.

City number.	CITY.	FACTORY WASTES.			
		Classes of factories by which produced.	Daily discharge (gallons).		
			Average.	Maximum.	Minimum.
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.				
7	Cleveland, Ohio	Breweries, oil refineries, steel and chemical works	21,124,800	(1)	(1)
10	Buffalo, N. Y	Breweries, tanneries, and chemical works	4,042,849	5,261,168	3,425,043
14	Newark, N. J	Metal and dye works and breweries	5,000,000	(1)	(1)
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.				
18	Los Angeles, Cal	Breweries and canneries	1,000,000	15,000,000	500,000
21	Indianapolis, Ind	Gas works, paper and cotton mills, and slaughterhouses	37,500,000	66,700,000	8,300,000
22	Louisville, Ky	Tanneries, dye works, and slaughterhouses	3,000,000	4,000,000	2,000,000
24	Providence, R. I	Dyeing and bleaching works	7,000,000	(1)	(1)
25	Rochester, N. Y	Breweries and dye works	53,964	69,797	39,745
31	Worcester, Mass	Tanneries, breweries, dyeing and wire mills	1,000,000	1,500,000	500,000
32	Atlanta, Ga	Bleaching works, gas plant, and soap factories	83,175	(1)	(1)
36	Paterson, N. J	Silk mills, dyeing and locomotive works	22,000,000	(1)	(1)
43	Nashville, Tenn	Steel plants, furnaces, and railroad shops	675,000	750,000	600,000
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.				
47	Albany, N. Y	Breweries, gas and chemical works	800,000	(1)	(1)
76	Hoboken, N. J	Tanneries, silk and glass works	1,000,000	(1)	(1)
92	East St. Louis, Ill	Roofing manufactories	750,000	1,000,000	500,000
94	Brockton, Mass	Leather bleachers	2,000,000	2,250,000	1,775,000
99	Covington, Ky	Breweries and dye works	20,000	(1)	(1)
101	Passaic, N. J	Dye works, wool and cotton mills	3,850,000	4,200,000	3,500,000
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.				
114	Springfield, Ohio	Tanneries, breweries, dye and slaughter houses	37,110	42,412	17,395
122	Sacramento, Cal	Breweries and laundries [2]	1,440,000	3,000,000	960,000
130	Wheeling, W. Va	Breweries, metal works, and slaughterhouses	132,000	176,000	101,000
143	Elmira, N. Y	Breweries, foundries, and meat-packing houses	30,000	100,000	22,500
149	West Hoboken, N. J	Silk mills and breweries	62,500	(1)	(1)

[1] Not reported.

[2] Purified in cesspools before entering the sewers.

The average per capita discharge of sewage per day for all of the 23 cities for which statistics are presented in the foregoing statement was 164 gallons. This includes, of course, manufacturing wastes and rain water, so that the per capita production of house waste was much less than this.

Pumping of sewage.—In Table 8 is presented a list of all the cities reporting the pumping of sewage or the pumping of water to assist in the final disposal of sewage during 1909. The cost of pumping in these cities is included with the payments of expenses for sewers shown in Table 1, and serves to explain in part the high cost of operation and maintenance per mile of sewers for certain cities. Only 33 of the 158 cities canvassed in this investigation used pumps in connection with the operation of their sewer systems or with the disposal of their sewage, during the year, and the pumping reported for Milwaukee, Wis., was not of the sewage itself, but of water from Lake Michigan to flush out the river into which the sewers empty. Of the 24 cities reporting both the quantity of sewage and the sewage pumped, only 12 reported the pumpage of more than 50 per cent of the sewage.

The pumps in Lynn, Mass., are operated only at high tide. Those in Grand Rapids, Mich., are operated only in case of high water in the Grand River. Those in Saginaw, Mich., are designed for use only in case of heavy rainfall or when the river is high.

Before pumping, sewage is usually passed through coarse screens to remove floating objects that might otherwise clog the pumps, and more rarely sand catchers or grit chambers are provided. Below is a statement of the reported apparatus employed by a number of cities for freeing the sewage from matter that might be injurious to the pumps.

City number.	CITY.	Apparatus employed before pumping.
5	Boston, Mass	Screening.
14	Newark, N. J	Settling and screening.
16	Washington, D. C	Settling, screening, and skimming.
24	Providence, R. I	Settling and screening.
29	Columbus, Ohio	Screening.
31	Worcester, Mass	Screening.
51	Reading, Pa	Screening.
94	Brockton, Mass	Screening.
122	Sacramento, Cal	Settling.
126	Salem, Mass	Screening.
133	Newton, Mass	Screening.
139	Woonsocket, R. I	Screening.

The other cities in which sewage was pumped reported definitely that it was subjected to no preliminary process prior to pumping, although in several of them the sewage was passed from the sewers into receiving tanks, in which more or less settling took place before pumping.

The table shows the daily capacity of the pumps, the average static head (that is, the height to which the sewage was raised by means of the pumps), and the kinds of power used.

Under the heading "Pumping station expenses for year" are shown the total expenses and the expenses per million gallons of raising sewage one foot. The costs as given do not include any allowance for interest on the cost of the station, or for depreciation.

Sewage purification systems.—The statistics of Table 9 relate to the systems of sewage purification that had been installed prior to the close of the year 1909. The importance of these statistics arises from the fact that with the increase in the number and population of cities during the last few decades, the problem of sewage disposal has become one of the most important of all municipal problems. Many cities and towns, especially in the eastern portion of the United States, have been compelled to purify their sewage to a greater or less degree. Of the 158 cities comprehended in this report, 19 were reported as operating sewage-purification plants. Of these only 6 were reported as purifying the whole of their sewage; although 2 others, Providence, R. I., and Worcester, Mass., purified practically all of it, or 97.3 and 99.5 per cent, respectively.

At the close of the year 1909 sewage purification plants were under process of construction in Baltimore, Md., and Waterbury, Conn.; Auburn, N. Y., was engaged in extending its system; plans for a sewage disposal plant were under way in McKeesport, Pa.; and the board of public works of Philadelphia, Pa., was making a preliminary investigation with a view to the purification of the sewage of that city.

Table 9 has been designed to present statistics of the sewage purification systems in use at the close of the year 1909. Statistics with regard to the treatment of the sewage in tanks and beds are given in detail in Tables 10 and 11.

The figures showing the quantities of sewage treated daily and the percentage that those quantities form of the total quantity of sewage are in most cases estimates and only roughly approximate the actual facts. In general, the sewage of combined systems is not purified. To this general statement there are a few exceptions. The cities with such systems which purify sewage usually purify all the contents of their sewers except in times of heavy rains, where a considerable portion of the resulting heavy total flow generally goes out through storm overflows and consequently is not purified.

The degree of purification secured at the different plants varies with local conditions. Where a high degree of purification is secured there generally is a preliminary, a main, and a finishing process. If a low degree of purification is all that is secured, the process which at another place might be preliminary is the main or sole process. The simplest form of purification is the removal of grosser forms of suspended matter by coarse screening. Next to this comes purification by sedimentation, which is secured by the use of small grit chambers to remove sand and gravel, or of large settling tanks to remove other suspended matter. The main purification process in a complex system requires some kind of filtration, or, as in Europe, the application of the sewage to the land in sewage farming. Finishing processes may include secondary settling tanks, secondary filters, or disinfection by a germicide. The processes mentioned, as well as variations of them, may be combined in different ways, or almost any one of them used singly, to meet the varying local requirements.

Sewage purification in tanks.—The purification of sewage in tanks, the statistics of which are presented in Table 10, is generally only one step in the process of sewage purification. The purification of sewage in tanks results primarily from the action of gravity in depositing the suspended matter of the sewage. In plain settling or sedimentation tanks all the purification secured results from gravity alone. In chemical precipitation tanks purification is secured by the combined action of gravity and the use of some chemical which produces a flocculent precipitant. The sludge, or solid or semisolid matter, which is produced in either plain settling or chemical precipitation tanks, is not easy to dispose of. Septic tanks are employed to lessen the bulk of the sludge through the putrefactive or reducing action of anaerobic bacteria. Septic tanks are simply modified forms of plain settling tanks, the modification consisting chiefly of provisions for retaining the sludge at the bottom of the tank until it can be partly liquefied and gasified, and of holding back the mat or scum, consisting of finely divided floating matter.

Chemical precipitation tanks were reported by only three cities, but of the total 74 tanks reported 42 were of this type, and a much larger quantity of sewage was purified by them than by the septic and settling tanks combined.

Average detention period.—The average detention period for several cities is very short, but the figures reported are shown in the table. The average detention period for the chemical precipitation tanks in Brooklyn Borough of New York City and in New Britain, Conn., was reported as from about 40 to 60 minutes. This is an unusually short time, and would seem to indicate that the tanks were much overworked.

Sludge produced.—Few cities, apparently, were able to make an accurate estimate of the amount of sludge produced per million gallons of sewage treated. The report for Brooklyn Borough, New York City, and Providence, R. I., was for liquid sludge; for the other cities the report secured by the Bureau of the Census did not indicate whether the sludge was fluid or dried.

Disposition of sludge.—In the Borough of Brooklyn, N. Y., sludge was dumped on land; in the Borough of Queens, at the Far Rockaway and Jamaica plants, it was discharged on the surface of low ground around the plants and allowed to accumulate, a small portion being occasionally carted away by farmers; at the Newtown plant it was run out to beds of coal placed over steam pipes, and after a period of drying was burned under the boiler; in Providence, R. I., it was pressed into cakes and dumped 15 miles out to sea; in Worcester, Mass., it was pressed into cakes and hauled to dumps, from which about 30 per cent was carted away by farmers; in Reading, Pa., it was transported to lagoons and allowed to dry; in Pawtucket, R. I., it was buried; in Canton, Ohio, and New Britain, Conn., it was pumped on to adjacent land, permitted to dry, and used by farmers for fertilizer; and in Little Rock, Ark., it was flushed into Fourche Bayou; in Columbus, Ohio, and Omaha, Nebr., it was reported as being dumped into water.

Chemicals used in the purification of sewage in chemical precipitation tanks.—The chemicals used per 1,000,000 gallons of sewage treated in the chemical precipitation tanks of Queens Borough, New York City, were 1 barrel of lime and 10 pounds of chloride of iron. The sludge produced by each million gallons of sewage was treated with chlorine gas, which was generated by the mixture of 2.7 pounds of black oxide of manganese, 6.2 pounds of sulphuric acid, and 3.7 pounds of common salt. The chemical precipitation tanks of Brooklyn Borough, New York City, used 2.7 pounds of black oxide of manganese, 200 pounds of lime, 6.2 pounds of sulphuric acid, and 3.7 pounds of common salt, to each million gallons of sewage treated. The use of chloride of iron was not reported for the tanks of this borough. In Providence, R. I., and Worcester, Mass., the chemicals used per million gallons treated in the tanks were 700 and 935 pounds of lime, respectively.

Cost of precipitation tanks.—An attempt was made to ascertain the cost of constructing the tanks, but for several cities no report could be obtained of the cost of the tanks apart from the cost of the filter beds or of the pumping stations used in connection with sewage purification. Where the information could be obtained for the tanks separately it is shown in the table.

Sewage purification in filters.—The statistics of sewage purification by filters or filter beds are presented in Table 11. Filters for the purification of sewage are of three general kinds: The sand filter, the contact bed, and the sprinkling or percolating filter. The kind most commonly used is the sand filter, which is a bed of sand through which the sewage sinks, the effluent being carried away by tile pipes which underlie the bed. These filters render sewage innocuous in two ways: They strain it, thus removing suspended solids, and they bring about oxidation of putrescible material through bacterial action. There are two types of sand filter, the constant and the intermittent.

The contact bed is a tank which is filled with stone or coke. The sewage is pumped into the tank, filling the interstices between the stone, and coming into contact with anaerobic bacteria which have found lodgment there. After being thus subjected to bacterial action for a period usually of several hours, the sewage is slowly drained off and the bed is given a period of rest before being filled again. In filters of this type the purification is almost entirely that of oxidation resulting from bacterial action, as very little suspended matter is strained out and retained in the filter.

The sprinkling or percolating filter resembles the contact bed in its construction and in the principle governing its action. It differs from it, however, in that the sewage is not confined upon the bed, but is sprinkled over the surface, trickles or percolates down through it, and is purified by the bacteria adhering to the stone, as in the case of the contact bed.

All other kinds of filters used are simply modifications of the three described above, and depend for their efficiency upon the same principles.

Of the three types of filter described, the sand filter is usually the most effective. It is, however, slow in action and it is owing to this defect that the other types are coming into use.

Beds or filters were used in the year 1909 in the process of sewage purification in 13 of the 158 cities covered by this report. Sand filters were reported by 10 cities, sprinkling filters by 2 cities, and contact filters by 1. As shown by Table 9, the sewage in most of these cities received some preliminary treatment before reaching the filters. No preliminary treatment of sewage prior to its discharge on to the sand filters was reported for Akron, Ohio, and Altoona, Pa. In Des Moines, Iowa, the sewage was previously treated in septic tanks; in Houston, Tex., Brockton, Mass., and Woonsocket, R. I., it was screened; in New York, N. Y., it was screened, passed through grit chambers, and treated in chemical precipitation and settling tanks; in Worcester, Mass., the treatment was the same as in New York, with an additional treatment in the septic tanks; in Pawtucket, R. I., and New Britain, Conn., it was screened and settled; in Reading, Pa., screened and settled; in Columbus, Ohio, screened, settled, and treated before being applied to the sprinkling filters; and in Auburn, N. Y., screened, passed through grit chambers, and treated in septic tanks before being applied to the contact bed.

In New Britain, Conn., during most of the year the only preliminary treatment the sewage received was screening. Toward the end of the year for which these statistics were obtained the settling tanks shown in the table for that city were installed, and their operation has resulted in materially reducing the expense of caring for the filters, since much of the sludge from the sewage which formerly clogged the filters is now removed by means of the tanks.

In the columns under the heading "Dosing" are shown the number of hours during which the sewage flowed upon the filters during each period of charging, and the number of times per month that the filters were used. In New York, N. Y., and Houston, Tex., the filters are constructed in such a way that the sewage flows upon them continuously, except when turned off in order to rake or renew the filtering material. In Des Moines, Iowa, and Akron, Ohio, they were used alternately, the sewage flowing over one filter in the first-named city for 10 hours, and then over the other for an equal length of time; and in the second city, over each bed alternately for 2 hours. In Woonsocket, R. I., the sewage was pumped from a receiving well, when full, to the sand filter beds. It took about 6 hours of pumping to fill one filter, and on an average each was filled every fifth day.

Reports showing the percentage of the suspended solids removed were obtained for only a portion of the cities.

The expenses of the operation of the beds were reported for nearly all cities, and great differences are shown as to the cost per million gallons of sewage treated and per acre of filters. The cost per million gallons treated is undoubtedly a more nearly just unit of comparison for determining relative efficiency than that per acre of filters.

Miscellaneous information relating to sewage disposal.—The reports of individual cities relative to sewage disposal contain interesting information which is not appropriate for tabular treatment. The more valuable of this is given in the following paragraphs:

New York, N. Y., Brooklyn Borough.—There are four disposal plants in this borough—(1) Twenty-sixth Ward Disposal Works, (2) Station 2, Coney Island Disposal Works, (3) Station 3, Coney Island Disposal Works, and (4) Sheepshead Bay Disposal Works. The sewage flows by gravity to these plants. A portion, but not all, of the sewage of the borough is purified and pumped into bays.

New York, N. Y., Queens Borough.—There are three sewage disposal plants in Queens Borough, one at Far Rockaway, one at Jamaica, and one at Newtown. Those at the first two places are chemical precipitation plants, while that at Newtown employs sedimentation tanks and sand filtration. At the Jamaica plant the sewage is not pumped. The capacity of the plant is 3,500,000 gallons per day. At the Far Rockaway plant all the sewage is pumped from the receiving well to purification basins; the capacity of this plant is 1,500,000 gallons per day. At the Newtown plant all the sewage is pumped from the receiving well to the sedimentation tanks and again from the sedimentation tanks to the filter beds. The capacity of this plant is 1,000,000 gallons per day.

Providence, R. I.—Before being pumped, the sewage passes through a small settling basin or grit chamber, and then is screened. The screens are one-half inch in mesh and slightly inclined. After screening, the sewage is pumped into the precipitation tanks. The effluent from these is discharged into Providence River at Field's Point under 36 feet of water.

St. Paul, Minn.—The sewage disposal plant in St. Paul purifies sewage from only about 36 acres. There are 55 house connections on the system, and the total sewage purified is less than 1 per cent of the total quantity of the city sewage.

Portland, Oreg.—The sewage purified is from only a small portion of the city, and the plant consists of only two small and cheaply built septic tanks, into which the sewage flows continuously. These tanks are only temporary affairs. The effluent from them flows into a small stream that is tributary to the Willamette River.

Columbus, Ohio.—In the sewage disposal plant these are four primary septic tanks and two secondary septic tanks. The sewage, after being screened, flows through either one or more of the primary tanks and through one or both of the secondary tanks. From the secondary tanks the sewage passes to the percolating filters, from which it passes through two settling basins and thence to the river. It is not possible to by-pass the sewage around the septic tanks, but it is possible to by-pass the effluent from the sprinkling filters around the settling basins. The period of detention of the sewage in the septic tanks and settling basins is governed by the number of units in service at that time, and volume of sewage which is being treated, and varies from 6½ to 16 hours. The 6½ hours detention is secured when one primary and one secondary tank are in service; and the longest period is secured when all four primary and both secondary tanks are in use. Any combination of the primary and secondary tanks is possible. The average period of detention as the plant is ordinarily operated is as follows:

Primary tank	1.2 hours.
Secondary tank	3.7 hours.
Final settling basin	3.2 hours.

The above data are based on the treatment during the summer of 15,000,000 gallons per day in one primary septic tank, one secondary septic tank, and one final settling basin.

Worcester, Mass.—A total of 16 tanks was reported for this city, 14 were chemical precipitation tanks, and 2 (1 a settling tank and 1 a septic tank) were for experimental purposes. The city has experimented with contact beds and percolating filters, but these were not in operation at the close of 1909. The average number of gallons of sewage treated daily was 14,368,000, of which 10,100,000 gallons was treated in chemical precipitation tanks, and 4,268,000 on sand filter beds. The sewage that was treated on the beds did not pass through the tanks.

Reading, Pa.—The sewage is first passed through what is called a segregator, which consists of a screen having 40 meshes to the inch. It then passes in succession through settling tanks, sprinkling filters, and final settling tanks, after which it flows over a weir into the Schuylkill River.

Des Moines, Iowa.—The effluent from one of the septic tanks is discharged into a small creek leading to the Des Moines River, about one-half mile up stream from the Des Moines city waterworks intake.

Brockton, Mass.—Before being pumped, the sewage flows into a receiving tank of 600,000 gallons capacity, provided largely for convenience in pumping, from which it is pumped to the purification works. More or less of the heavy solids settle in the receiving tank.

Pawtucket, R. I.—There are two sewer districts in this city; the sewage from one is discharged into the Blackstone River direct, and that from the other purified, the effluent flowing into the Moshassuck River. In the process of purification the sewage passes through a half-inch mesh screen before being delivered to the settling or sedimentation tanks from which it goes to the filters. The tanks are drawn daily and washed clean once a week. The quantity of sewage treated on the filter beds was 137,145 gallons daily. The filter beds are soon to be abandoned, and the sewage of this district will then be treated at the Providence sewage disposal works.

Canton, Ohio.—The Canton (Ohio) plant was one of the early chemical precipitation plants of the country, but the use of chemicals has been discontinued, and the tanks are now used only for the settling of sewage. Effluent from the tanks flows into Nimishillen Creek, and the sludge is pumped out onto the adjacent land. After it is dried it is carted away by the farmers to be used as fertilizer.

New Britain, Conn.—The settling tanks were not installed until September, 1909. Their operation has resulted in relieving the sand filter beds so that the expense of raking and caring for them has been greatly lessened.

Auburn, N. Y.—The sewage-disposal plant treats only 3.8 per cent of the total sewage of the city. It was not put into operation until near the close of 1909. The city is now constructing another sewage-disposal plant, and within a short time it is expected that all of the sanitary sewage of the city will be purified.

Removal of night soil.—Most writers on city wastes include liquid and semiliquid wastes of cities under the generic title "sewage," and thus bring the "night soil" of the unsewered houses and sections of cities into the same class with the waste that is carried off by sewers and open drains. This practice has been followed by the Bureau of the Census in the present report. It is true that from the viewpoint of the method of removal the classification is open to objections. But a study of the statistics of night soil removed can best be presented in connection with statistics of sewers, since the statistics first mentioned are needed to supplement the latter to present a complete statement of the means placed at the disposal of the citizens, or adopted by them, for removing the liquid and semi-liquid wastes from their houses; the statistics of night soil removed having to do with the removal of this class of waste in one portion of the city, or in a certain class of houses, and the statistics of sewers having to do with the removal of the same class of waste in the remaining and usually greater portion.

Removal of night soil may be either at the expense of the city or of the householder, and this is the reason for the treatment of the subject in the table which follows. In the first part of the table are given statistics for those cities in which removal is at the expense of the city, and in the second for those in which it is at the expense of the householder. The table indicates that removal in much the larger number of cities was at the expense and under the private arrangement of the householder. For convenience of comparison between the cities of the same state and the same section of the country, the cities have been arranged according to their size in the different states in both tables, and the states have been arranged according to geographic divisions. The figures showing the population of the cities are of the population outside of the area served by the city sewer system. The figures showing the number of premises from which night soil was removed, and the number of tons removed, are in many cases estimates, especially in those cities where removal was at the expense of the householder. In some of the cities of Part II the removal was upon permits issued by the health department of the city; and where this is the case, the number reported is sometimes the number of permits issued, and not the number of premises from which removed.

For many cities no estimate of the quantity in tons could be obtained, an estimate of the number of loads or barrels or cubic feet being all that was available. Wherever possible, these amounts were reduced to tons, and appear as such in the table.

City number.	GEOGRAPHIC DIVISION, STATE, AND CITY.	Population not served by sewer system (estimated).	Number of premises from which night soil was removed.	Quantity of night soil removed (tons).
	Grand total	2,898,345	[1] 163,980	[1] 90,097
	I.—North Atlantic division	1,021,380	[1] 19,820	[1] 26,893
	II.—South Atlantic division	236,628	27,779	[1] 16,759
	III.—North central division	965,563	38,823	[1] 29,763
	IV.—South central division	451,848	63,528	[1] 10,889
	V.—Western division	222,926	14,030	[1] 5,793

I.—CITIES IN STATES OF THE NORTH ATLANTIC DIVISION IN WHICH NIGHT SOIL WAS REMOVED BY CITY EMPLOYEES.

City number.	GEOGRAPHIC DIVISION, STATE, AND CITY.	Population not served by sewer system (estimated).	Number of premises from which night soil was removed.	Quantity of night soil removed (tons).
	Total	35,127	4,483	12,710
	Massachusetts:			
54	New Bedford	2,718	500	500
58	Lynn	4,358	1,301	2,432
62	Lawrence	3,096	*25*	*42*
94	Brockton	15,275	1,907	8,946
123	Malden	9,680	750	790

II.—CITIES IN STATES OF THE SOUTH ATLANTIC DIVISION IN WHICH NIGHT SOIL WAS REMOVED BY CITY EMPLOYEES.

City number.	GEOGRAPHIC DIVISION, STATE, AND CITY.	Population not served by sewer system (estimated).	Number of premises from which night soil was removed.	Quantity of night soil removed (tons).
	Total	107,071	12,887	[1] 10,919
	District of Columbia:			
16	Washington	26,430	*4,250*	*4,779*
	Georgia:			
32	Atlanta	55,916	7,495	6,140
85	Savannah	24,725	1,142	(2)

III.—CITIES IN STATES OF THE NORTH CENTRAL DIVISION IN WHICH NIGHT SOIL WAS REMOVED BY CITY EMPLOYEES.

City number.	GEOGRAPHIC DIVISION, STATE, AND CITY.	Population not served by sewer system (estimated).	Number of premises from which night soil was removed.	Quantity of night soil removed (tons).
	Total	99,468	10,978	[1] 14,453
7	Ohio:			
	Cleveland	12,021	1,628	*5,372*
	Illinois:			
150	Joliet	14,198	300	1,350
	Michigan:			
42	Grand Rapids	30,060	5,704	4,842
137	Kalamazoo	17,999	336	216
	Iowa:			
128	Davenport	17,495	471	2,673
	Wisconsin:			
132	Superior	7,695	2,539	(2)

IV.—CITIES IN STATES OF THE SOUTH CENTRAL DIVISION IN WHICH NIGHT SOIL WAS REMOVED BY CITY EMPLOYEES.

City number.	GEOGRAPHIC DIVISION, STATE, AND CITY.	Population not served by sewer system (estimated).	Number of premises from which night soil was removed.	Quantity of night soil removed (tons).
	Total	81,834	34,343	5,523
	Tennessee:			
39	Memphis	14,685	*15,000*	1,086
	Alabama:			
79	Birmingham	23,600	845	1,200
	Texas:			
69	Houston	43,549	18,498	3,237

V.—CITIES IN STATES OF THE WESTERN DIVISION IN WHICH NIGHT SOIL WAS REMOVED BY CITY EMPLOYEES.

City number.	GEOGRAPHIC DIVISION, STATE, AND CITY.	Population not served by sewer system (estimated).	Number of premises from which night soil was removed.	Quantity of night soil removed (tons).
	Total	48,947	2,320	1,467
	Washington:			
49	Spokane	48,947	2,320	*1,467*

[1] Includes only amounts for cities reporting quantity removed.

[2] Not reported.

I.—CITIES IN STATES OF THE NORTH ATLANTIC DIVISION IN WHICH NIGHT SOIL WAS REMOVED BY HOUSEHOLDER.

City number.	GEOGRAPHIC DIVISION, STATE, AND CITY.	Population not served by sewer system (estimated).	Number of premises from which night soil was removed.	Quantity of night soil removed (tons).
	Total	986,253	[1] 15,337	[1] 14,183
	Massachusetts:			
5	Boston	2,312	188	375
31	Worcester	16,335	55	351
38	Fall River	33,886	2,412	(2)
44	Lowell	9,148	194	(2)
45	Cambridge	6,531	12	10
60	Springfield	4,210	20	....
93	Holyoke	1,377	6	(2)
133	Newton	8,380	253	455
141	Fitchburg	10,978	100	94
151	Taunton	23,678	575	1,660
	Rhode Island:			
24	Providence	25,715	*1,500*	(2)
	Connecticut:			
34	New Haven	31,337	225	(2)
48	Bridgeport	9,301	30	(2)
127	New Britain	7,523	175	(2)
	New York:			
1	New York	345,913	(2)	*3,262*
10	Buffalo	34,614	38	(2)
25	Rochester	1,664	41	(2)
64	Troy	6,715	546	*2,714*
75	Schenectady	2,203	275	(2)
148	Auburn	6,283	380	(2)
	New Jersey:			
14	Newark	75,489	102	*153*
19	Jersey City	41,482	719	(2)
36	Paterson	27,075	*314*	*471*
55	Camden	47,532	530	....
74	Elizabeth	6,138	(2)	*600*
76	Hoboken	17,342	41	(2)
115	Atlantic City	(3)	*100*	(2)
149	West Hoboken	4,268	93	(2)
	Pennsylvania:			
35	Scranton	42,508	680	*2,040*
51	Reading	22,555	2,754	(2)
83	Wilkes-Barre	15,742	*51*	(2)
95	Johnstown	23,833	*152*	(2)
102	Altoona	6,287	342	*282*
104	Allentown	50,152	491	*1,500*
111	Lancaster	10,715	193	(2)
118	York	(4)	1,250	(2)
129	McKeesport	7,032	*500*	216

II.—CITIES IN STATES OF THE SOUTH ATLANTIC DIVISION IN WHICH NIGHT SOIL WAS REMOVED BY HOUSEHOLDER.

City number.	GEOGRAPHIC DIVISION, STATE, AND CITY.	Population not served by sewer system (estimated).	Number of premises from which night soil was removed.	Quantity of night soil removed (tons).
	Total	129,557	14,892	[1] 5,840
	Delaware:			
59	Wilmington	26,444	1,551	(2)
	Virginia:			
40	Richmond	20,053	3,500	(2)
81	Norfolk	24,492	*840*	(2)
	West Virginia:			
130	Wheeling	1,396	852	*1,050*
	South Carolina:			
89	Charleston	43,564	2,149	*4,000*
	Florida:			
96	Jacksonville	13,608	*6,000*	*790*

III.—CITIES IN STATES OF THE NORTH CENTRAL DIVISION IN WHICH NIGHT SOIL WAS REMOVED BY HOUSEHOLDER.

City number.	GEOGRAPHIC DIVISION, STATE, AND CITY.	Population not served by sewer system (estimated).	Number of premises from which night soil was removed.	Quantity of night soil removed (tons).
	Total	866,095	27,845	[1] 15,310
	Ohio:			
12	Cincinnati	66,934	2,333	*8,642*
29	Columbus	18,350	850	*1,912*
67	Youngstown	16,245	1,270	(2)
107	Canton	16,927	627	(2)
114	Springfield	26,688	*1,700*	(2)
	Indiana:			
78	Evansville	45,747	812	(2)
	Illinois:			
2	Chicago	392,156	2,802	(2)
86	Peoria	2,095	*300*	(2)
92	East St. Louis	11,682	*360*	(2)
109	Springfield	28,799	*6,374*	(2)
144	Quincy	21,557	335	*1,000*
	Michigan:			
137	Kalamazoo	17,999	*6,664*	*1,400*
	Wisconsin:			
156	La Crosse	12,176	*350*	(2)
	Minnesota:			
17	Minneapolis	147,330	1,598	(2)
	Iowa:			
61	Des Moines	24,592	913	2,096
134	Dubuque	10,065	88	260
	Missouri:			
63	St. Joseph	6,753	469	(2)

IV.—CITIES IN STATES OF THE SOUTH CENTRAL DIVISION IN WHICH NIGHT SOIL WAS REMOVED BY HOUSEHOLDER.

City number.	GEOGRAPHIC DIVISION, STATE, AND CITY.	Population not served by sewer system (estimated).	Number of premises from which night soil was removed.	Quantity of night soil removed (tons).
	Total	370,014	29,185	[1] 5,366
	Kentucky:			
99	Covington	17,720	95	*95*
	Tennessee:			
43	Nashville	39,619	11,000	(2)
120	Chattanooga	5,634	*600*	(2)
145	Knoxville	4,017	*300*	(2)
	Arkansas:			
113	Little Rock	6,844	4,000	2,400
	Louisiana:			
15	New Orleans	234,470	*6,000*	(2)
	Oklahoma:			
97	Oklahoma City	18,273	600	150
	Texas:			
56	Dallas	38,856	*5,200*	*2,025*
140	Galveston	4,581	1,390	696

V.—CITIES IN STATES OF THE WESTERN DIVISION IN WHICH NIGHT SOIL WAS REMOVED BY HOUSEHOLDER.

City number.	GEOGRAPHIC DIVISION, STATE, AND CITY.	Population not served by sewer system (estimated).	Number of premises from which night soil was removed.	Quantity of night soil removed (tons).
	Total	173,979	11,710	[1] 4,326
	Montana:			
135	Butte	8,669	822	*2,448*
	Colorado:			
27	Denver	57,112	1,195	(2)
	Utah:			
57	Salt Lake City	22,330	7,043	1,478
	California:			
18	Los Angeles	85,868	*2,650*	*400*

---

[1] Includes only amounts for cities reporting quantity removed.

[2] Not reported.

[3] Sewer system owned by private corporation.

[4] Sewer system not in use, as state laws prohibit the pollution of stream planned for outlet.

PART II.—REFUSE-DISPOSAL SERVICE.

REFUSE AND THE SERVICE FOR ITS COLLECTION AND DISPOSAL.

Classes of city refuse.—In this report, as in the investigation upon which it is based, the Bureau of the Census applies the word *refuse* as the generic term for all city wastes other than those in a liquid or semiliquid form, to which are given the names *sewage* and *night soil.* One of the best statements of the classes or kinds of city refuse that has been prepared was published in the Journal of the Society of Chemical Industry in March, 1908. That statement is, with minor modification, presented below:

- I. Household refuse:
  - 1. Garbage—
    - (a) Animal matter.
    - (b) Vegetable matter.
    - (c) Meat and bones.
    - (d) Fruit.
  - 2. Ashes—
    - (a) Steam ashes.
    - (b) Household ashes
  - 3. Rubbish—
    - (a) Paper.
    - (b) Wood.
    - (c) Bags and bedding.
    - (d) Leather and rubber.
    - (e) Metals.
    - (f) Bottles, glass, and crockery.
    - (g) Sweepings from buildings.
- II. Street refuse:
  - 1. Street sweepings—
    - (a) Animal manure.
    - (b) Pavement dirt.
    - (c) Droppings from carts.
    - (d) Materials from building construction.
    - (e) Rubbish and leaves.
  - 2. Dead animals.
  - 3. Snow.
- III. Trade refuse:
  - 1. Cellar excavations.
  - 2. Materials from building construction.
  - 3. Stable manure.
  - 4. Market offal.
  - 5. Slaughterhouse offal.
  - 6. Dead animals.

The statistics of Part II of this report relate principally to the collection and disposal of household refuse, that is, garbage, ashes, and rubbish, although they also deal with the collection and disposal of dead animals, a class of street refuse.

Garbage consists of the animal and vegetable wastes from kitchens, markets, and slaughterhouses, and wastes of a similar character from manufacturing plants. *Ashes* consist of the incombustible residue of material used as fuel, and the unconsumed fuel that may be combined therewith. *Rubbish* is the discarded trash which accumulates in the household or results from trade operations. The most common articles included under the designation of rubbish are old papers, clothing, bedding, rags, wood, leather, furniture, boxes, barrels, cans, metal scraps, broken glass bottles, and similar articles. The term *dead animals* calls for no definition or explanation. Rubbish and ashes are comparatively free from moisture, whereas garbage and dead animals contain a large percentage of water.

The refuse-disposal service and its importance.—The term *refuse-disposal service* in this report is used as the designation of that branch or division of governmental activity that comprises the collection, sorting, and disposal of all city refuse other than street sweepings. This service is one that aids in conserving the public health as well as adds to the convenience and comfort of city dwellers. The refuse annually produced in a great city aggregates approximately three-fourths of a ton for every man, woman, and child therein; and the organic matter in certain classes of this refuse, if not promptly removed, decomposes with the production of disagreeable odors, and by attracting flies and other disease-communicating pests, may become a menace to public health.

Systems of refuse collection.—Two systems or methods of collecting refuse are in use in American cities. They are generally known as the combined and separate systems. The *combined system* of collecting refuse is the system or method by which all classes of refuse are collected together in one wagon, and which permits the individual householder to deposit his refuse in a single receptacle. The *separate system* of collecting refuse is the system or method by which different kinds of refuse are collected in different wagons, and which requires the individual householder to deposit his refuse in separate receptacles.

When two or three of the classes or kinds of household refuse mentioned are collected or disposed of together, the refuse so treated is spoken of in this report as *mixed refuse.* If disposed of in a mixed condition, by incineration or otherwise, it can be most economically and effectively collected by the combined system, while if the three classes of refuse are disposed of by three different methods all refuse should be collected by the separate system. Further, if one kind of refuse is disposed of by one method and the other two by a second, the system of collection will be a modification of the two mentioned above.

In some cities the rubbish collected by the separate system is found to contain portions of sufficient value to justify its sorting or separation into classes. Where this sorting is employed the work of the refuse-disposal service adds the process of "sorting" to the usual ones of "collection" and "disposal."

Methods of refuse disposal.—Refuse may be disposed of by six different methods: (1) By dumping upon land; (2) by dumping into water; (3) by plowing into or burying in the soil; (4) by feeding to swine; (5) by reduction; and (6) by incineration. Not all of these methods are applicable to all kinds of refuse. Garbage and street sweepings only can be effectively plowed into or buried in the soil, and garbage only can be reduced or fed to swine, while all classes of refuse can be dumped upon land or into water, or incinerated.

Units of service.—No common unit of the refuse-disposal service was employed in 1909 by the cities covered by this report, although there was and is great need for such a unit. Among the units that were in use for measuring quantity were the ton, the cubic yard, and the load, and for work performed the ton-mile, the cubic-yard mile, and the cart-day. The most scientific units are, however, the ton and ton-mile, because they are specific and determinable at slight expense, and because the ton has specific relations to the amount of work done by men, teams, furnaces, and reduction plants, and because the ton of refuse treated by any process bears a definite relation to the by-products in the form of heat from furnaces and grease and tankage from reduction works.

These units of service were not, however, employed in the preparation of this report except in the statistics of reduction plants and of animals incinerated, for the reason that the experience of the Bureau of the Census in collecting the data relating to the collection and disposal of refuse in 1907 demonstrated that the use of the cubic yard as the unit of quantity would procure more comparable and valuable results at the time of the investigation.

ACCOUNTS, RECORDS, AND REPORTS OF REFUSE-DISPOSAL SERVICE.

Financial records.—What has been said in the Introduction relating to the necessity for complete and uniform financial statistics of municipal activities holds in all respects in the case of the service of collecting and disposing of refuse. To assist in the introduction of correct accounts by those in charge of that service, as well as to stimulate the preparation of uniform and standard reports of the refuse-disposal service, there is presented in the paragraphs which follow a brief outline of a scheme of uniform accounts for city expenditures connected with the collection and disposal of refuse. The scheme presented for uniform accounts has been prepared in accordance with the general principles relating to the uniform accounts and reports given on pages 14 and 15, and includes the two orders of accounts to which were there given the names *summary* and *general.*

Accounts for expenses.
- 0. General or administrative expenses.
  - 00–09. (As needed.)
- 1. Expenses of collecting refuse.
  - 10. Collecting mixed refuse.
  - 11. Collecting garbage.
  - 12. Collecting ashes.
  - 13. Collecting rubbish.
  - 14. Collecting dead animals.
- 2. Expenses of sorting refuse.
- 3. Expenses of refuse disposal.
  - 30. Disposal of mixed refuse.
  - 31. Disposal of garbage.
  - 32. Disposal of ashes.
  - 33. Disposal of rubbish.
  - 34. Disposal of dead animals.
- 4. Expenses of night-soil service.
  - 40. Collecting night soil.
  - 41. Disposal of night soil.

Accounts for expenses—Continued.
- 5, 6, and 7. Together with subordinate general and primary accounts as needed. These accounts are to be used for distribution or incidental operating accounts and for recording expenses of other functional activities not properly classed, as for the refuse-disposal service.

Accounts for outlays:
- 8. Outlays—
  - 80. Horses.
  - 81. Vehicles.
  - 82. Other equipment.
  - 83. Incineration plant.
  - 84. Reduction plant.
  - 85. All other.

Accounts for revenues and appropriations:
- 9. Summary and general accounts.
  - 90–99. (As needed.)

In using the foregoing scheme of accounts, the following rule should be observed in separating the expenses of refuse disposal from those of refuse collection. In cases where the teams which collect refuse deliver the same to a dumping place on land or in water or to an incineration or reduction plant, treat all costs of teaming as costs of collection, and charge as expenses of disposal only those connected with the maintenance and operation of dumps, the maintenance of fires, and the hire of workmen on the land to which refuse is carried or on which it is burned, together with the cost of maintaining and operating incineration and reduction plants. In cases where teams haul refuse to boat landings or railway stations, treat as expenses of disposal all expenses so classed in the foregoing statement, and also all costs of transportation by water, rail, or otherwise to the place of final disposal.

In both cases, if it is possible, record transportation costs separately, in an account distinct from those for other costs of the refuse-disposal service.

If only one method of disposing of a given class of refuse is employed, attach descriptive words or phrases indicative of the method to the names of the accounts numbered 30 to 34, such as the words "by incineration," "by reduction," "by dumping upon land," "by dumping into water," "fed to swine," etc. In case more than one method of disposal is employed for one class of refuse, keep separate accounts of expenses of disposal for each method, and give to each a three-digit number, as outlined in the next paragraph.

Subgeneral and primary accounts.—Subgeneral, or three-digit, and primary, or four-digit, accounts may be arranged in such numbers and given such titles as the individual cities may find of administrative value, or as may assist in making the expense and outlay accounts best harmonize with the appropriations authorizing such expenditures. Subgeneral accounts should be arranged for recording the disposal of refuse by different methods. They may also be employed to record separately for each subdivision of service recorded in a general account the portion of the expenditures that were incurred for (1) salaries of the different classes of employees, (2) wages, (3) teaming (or work of teamsters furnishing their teams), (4) contract work, and (5) other objects. In case subgeneral accounts are used for recording the expenses of refuse disposal by different methods, primary accounts rather than subgeneral should be used for the separate recording of the information here referred to. So far as practicable, the name, or both name and number, of subgeneral accounts should indicate the subgeneral accounts to which they are subordinate.

Revenue and appropriation accounts.—For reasons stated on page 19 of Part I, no attempt is here made to list the principal accounts with revenues and appropriations. These accounts should, however, be given the numbers from 90 to 99, and be arranged and kept in accordance with the principles set forth on the page referred to.

Distribution or incidental operating accounts.—Accounts with stables, storehouses, shops, and other incidental operating plants should be kept according to approved accounting methods, and all amounts recorded as expenses in such accounts should be distributed to the general functional accounts. General accounts having the initial digit 5, 6, or 7 may be used for this purpose.

Accounts other than those for refuse-disposal service.—As already stated, if a department or officer having charge of the refuse-disposal service also has charge of any other branch of city service, the accounts for such other service should be kept entirely distinct from those for the refuse-disposal service itself. Departments or offices having expenses not properly chargeable to the refuse-disposal service, but wishing to record these according to the scheme of accounts above described, may give any of the unused numbers 5, 6, and 7, and 50 to 59, 60 to 69, and 70 to 79, to the additional accounts thus necessitated. In case the collection and disposal of refuse is under the supervision of any officer or board like that of a board of public works, the scheme of accounts here outlined and the use of numbers should be modified substantially as set forth in the case of sewers on page 20 of Part I.

Reports of refuse-disposal expenses, outlays, revenues, and appropriations.—With accounts arranged in accordance with the scheme outlined above, it will be easy for cities to prepare uniform reports. Reports should give such further details concerning salaries, wages, teaming, contract labor, etc., as may be of popular interest, and should show the degree to which the city does its own work in the refuse-disposal service and how far the work is entrusted to contractors. All statements of expenses, outlays, revenues, and appropriations should be net; that is, the total less any amounts received or paid in error, but later corrected by counterpayment or receipt. When accounts are on the basis of cash and warrant payments, this rule calls for a separate report of all payments and receipts in error, and receipts and payments in correction of error.

Physical and general records.—In addition to financial records, two classes of records of the refuse-disposal service should be kept: The first, of employees and work performed, to provide data for correlation with the data recorded in financial accounts; and the second, of equipment and general information relating to the service. Both classes of records should be so arranged as to provide separate and detailed information relating to (1) the collection of waste, (2) the disposal of waste, and (3) other services which may be performed by or under the direction of the department or officer in charge of the refuse-disposal service.

Records of employees and of work performed should be arranged to give for mixed refuse the information set forth in the following schedule, and also, so far as the schedule is applicable thereto, the same information for garbage, ashes, rubbish, dead animals, and night soil:

1. Number of tons collected.
2. Total and average distance hauled in miles.
3. Number of foremen and inspectors employed—
   (a) In collection.
   (b) In sorting.
   (c) In disposal.
4. Number of teamsters employed—
   (a) In collection.
   (b) In disposal.
5. Number of laborers employed—
   (a) In collection.
   (b) In sorting.
   (c) In disposal.

6. Days' service during year for each class of employees, and kind of work mentioned in 3, 4, and 5.
7. Average number of each class of employees mentioned in 3, 4, and 5 that were engaged at each of the classes of work mentioned in (a), (b), and (c).
8. Number of tons sorted.
9. Number of tons disposed of by each of the following methods:
   - (a) By dumping on land.
   - (b) By dumping into water.
   - (c) By burying in the soil.
   - (d) By feeding to swine.
   - (e) By reduction.
   - (f) By incineration.
10. Number of each class of workmen employed in connection with each method of disposal.
11. Days' service during year and average number of each class of workmen employed during the year in each method of disposal.

Record of equipment and general information should include—

1. Number of horses, carts, and wagons employed in refuse collection.
2. Schedule of collections of each class of waste collected.
3. Schedule of salaries and wages for each class of employees in refuse collection.
4. Schedule of hours per day and per week worked by each class of employees engaged in refuse disposal.
5. Number of horses, carts, wagons, boats, and other apparatus and equipment used in refuse disposal.
6. Description of reduction works and incineration plants.
7. Schedule of salaries and wages of those employed in refuse disposal.
8. Schedules showing number of employees by classes, hours of service, wages, etc., for those engaged in work other than the refuse-disposal service; such schedules to be arranged along lines described above for refuse collection and refuse disposal.

In case the department or officer in charge of the refuse-disposal service has charge of any other governmental service, the records should provide detailed and classified information with reference to such service.

Where waste is collected or disposed of, or both collected and disposed of, by contract, the city should require the contractors to keep complete records of the number of tons of different classes of refuse collected or disposed of, and of the equipment employed in the service. The records should be as complete as though the work were done by city employees.

COLLECTION OF REFUSE BY CITY EMPLOYEES AND CONTRACTORS.

Statistics of refuse collection.—In 123 of the 158 cities covered by this report, the city government provided for the collection of one or more classes of household refuse, either by city employees or by contractors. In 75 of these cities the greater portion of the household refuse produced was collected by city employees and contractors, and in 48 the smaller portion of such refuse was thus collected, the larger portion being collected under private arrangement by the householders.

For 3 of the 75 cities in which a considerable portion of the household refuse was collected at municipal expense—Saginaw and Bay City, Mich., and Joliet, Ill.—no report of the quantity collected could be obtained. Table 12 presents a general statistical summary of the refuse disposal service of 120 of the cities mentioned above, for which service there were local records of the quantity collected. Of the 19,264,373 cubic yards of refuse reported as collected in 120 cities, 13,913,236 cubic yards, or 72.2 per cent were collected by city employees, and 5,351,137 cubic yards, or 27.8 per cent, by contractors.

The work of collecting, sorting, and disposing of this refuse, together with the work of collecting and disposing of dead animals, was performed by 8,396 city employees and 4,054 employees of contractors. The number of cubic yards of refuse collected per 1,000 inhabitants varied greatly for the different cities, due principally to the varying character of the service; cities collecting all classes of refuse showing in all cases a higher average than those collecting only one or two. The averages for the four groups of cities arranged according to population form an ascending but irregular series, the difference in the group averages being due largely to the differences in the character of the service rendered, but in part to the fact that most cities as they increase in population adopt stricter municipal regulations with reference to the collection and disposal of refuse, and such regulations tend to increase the portion of the city's refuse that is collected by city employees or city contractors, and to decrease that which is collected and disposed of under private arrangement by the householders with the persons making the collections.

The average number of employees of the city and of the contractor for every 10,000 cubic yards collected, presented in Table 12, shows great variations as between the different cities, due largely to the factors which determine the averages of refuse collected per 1,000 inhabitants, but in part also to the difference in distances that the refuse was hauled, and to the differences in density of the population of the individual cities. Since the table does not in all cases provide detailed information with reference to the quantities of the different classes of refuse collected and in no case shows the distance hauled, the averages of the table can not be considered as indices of the relative efficiency of the refuse-disposal service as conducted by the employees of the city and those of contractors.

Collection of household refuse under the combined system.—Garbage, ashes, and rubbish were collected by city employees or contractors under the combined system in 14 municipalities; also in Richmond Borough, New York, N. Y. City employees made the collection in Atlanta, Ga.; Troy, N. Y.; Birmingham, Ala.; Charleston, S. C.; Mobile, Ala.; Chattanooga, Tenn.; Augusta, Ga.; Butte, Mont.; Macon, Ga.; Joliet, Ill.; and Richmond Borough, New York City. No report of quantity collected was made for Joliet, Ill. City contractors made the collection in Jersey City, Passaic, Elizabeth, and West Hoboken, N. J. Of the amount collected and reported in these 14 municipalities and 1 borough by the mixed system, 717,876 cubic yards were collected by city employees and 646,634 by city contractors.

In Salt Lake City, Utah, and Hoboken, N. J., garbage and ashes were collected together; in the former city by city employees and in the latter by city contractors. In Houston and Galveston, Tex., all rubbish collected by city employees or city contractors was collected with garbage, and in Louisville, Ky., a part of the rubbish was collected with garbage. Small quantities of combustible rubbish were also collected with garbage in a number of other cities in which garbage was incinerated.

Frequency of mixed-refuse collection.—Reports concerning the frequency of collection of garbage, ashes, and rubbish by the combined system were obtained from 14 municipalities. Collections six or seven times per week in the business section were reported by nine cities: New York, N. Y.; Jersey City, N. J.; Troy, N. Y.; Birmingham, Ala.; Passaic, N. J.; Chattanooga, Tenn.; Augusta, Ga.; Butte, Mont.; and Mobile, Ala. The same number of collections were made in the residence sections of all except Jersey City, N. J.; Birmingham, Ala.; Passaic, N. J.; and Butte, Mont., where collections in these sections were made but two or three times per week. Charleston, S. C., and Macon, Ga., reported three, and Atlanta, Ga., and West Hoboken, N. J., two collections per week.

Collection of garbage.—Garbage is more generally collected by city employees and contractors than is any other class of household refuse, by reason of its tendency to decompose and become a nuisance, and because experience has shown that householders can not be depended upon to remove and dispose of it with sufficient frequency and regularity. The collection and disposal of garbage are theoretically separate services, and expenditures therefor should be segregated and shown separately in city accounts and reports; yet in practice they are seldom fully segregated. This is especially the case where the garbage is dumped upon or buried in land or dumped into water. An attempt has, however, been made in the following study to differentiate the service of collecting garbage from that of its disposal, wherever such segregation has been possible.

In 112 of the 158 municipalities covered by this report the collection of garbage for some portions or all of the year was at the expense of the municipality, either by city employees or city contractors. In three other cities—Denver, Colo., and Newton and Fitchburg, Mass.—the collection was by city contractors, free of cost to the city, for the privilege of utilizing the garbage. Of the garbage collected by city employees or city contractors in the 115 municipalities referred to, a part or the whole was collected under the combined system in the 20 municipalities mentioned in the first and second paragraphs on this page. All garbage collected by city employees and city contractors in the 95 other cities, and some of the garbage collected in New York, N. Y., and Louisville, Ky., was collected by the separate system.

Of the 98 cities collecting a part or the whole of their garbage by the separate system, by city contractors or city employees, 52 made their collections by city employees and 43 by city contractors; and 3—New York, N. Y., Boston, Mass., and Portland, Me.—in part by city contractors and in part by city employees.

Collection of ashes.—The collection and disposal of ashes are seldom separate services. Ashes are generally dumped upon low lands, and their disposal in this manner is merely incidental to their collection, no separate equipment or separate force of men being employed in the disposal, except occasionally a small force of men at the dumps.

Ashes were collected by municipal employees or municipal contractors in 85 of the 158 municipalities covered by this investigation; and for 82 of these 85 municipalities statistics of ash collection are presented in Table 12. In 31 of these cities ashes were collected by contractors and in 51 by city employees. The quantity collected in Yonkers, N. Y., was not reported, and the quantity reported for Wilkes-Barre, Pa., includes only the quantity collected in the general spring clean-up.

Of the 85 cities in which ashes were collected by city employees or city contractors, including the 3 for which no reports of quantities collected were received, 34 collected them by the separate method, and for 32 of these the amounts collected are given in Table 12, although it is probable that in several of these 32 cities small quantities of miscellaneous rubbish were included with the ashes, and it is known that in Newport, Ky., small dead animals were included with them. In 14 municipalities mentioned by name on this page, the ashes were collected in combination either with garbage alone or with garbage and rubbish; and in 35 cities ashes were collected with rubbish. In 5 of these, however—Cleveland, Ohio; Newark, N. J.; Louisville, Ky.; Hartford, Conn.; and Holyoke, Mass.—waste paper was collected separately.

Definite reports concerning the frequency of ash collections were received from 72 cities, 56 of these being cities with collections by city employees and 16 cities with collections by contractors. In 18 cities daily collections were reported for specified portions if not for all of the city. Collections three times per week were reported by 8 cities, twice per week by 15, and once per week by 23.

Collections by city employees were made less frequently than once a week in the following cities: Los Angeles, Cal., and Springfield, Ohio, every two weeks; Springfield and Pittsburg, Mass., every two weeks in winter and every four weeks in summer; Dayton, Ohio, every month; Toledo, Ohio, every six months; Wilkes-Barre, Pa., once a year.

In Indianapolis, Ind., collections were made by contractor every two weeks.

The number of collections, once a week or more, by cities, grouped both on the basis of frequency and on that of the party collecting, whether city or contractor, was as follows for 1909:

I. Cities having daily collection:
  a. By city employees—
    New York, N. Y.[1]
    Boston, Mass.[2]
    Baltimore, Md.[3]
    Louisville, Ky.[4]
    Rochester, N. Y.[5]
    Memphis, Tenn.[6]
    Nashville, Tenn.[7]
    Salt Lake City, Utah.[2]
    Manchester, N. H.[8]
    Norfolk, Va.
    Oklahoma City, Okla.[9]
    Montgomery, Ala.
    Joliet, Ill.
  b. By contractors—
    Philadelphia, Pa.
    Boston, Mass.[10]
    Utica, N. Y.[10]
    Hoboken, N. J.
    Sioux City, Iowa.[9]
II. Cities having collections three times per week:
  a. By city employees—
    Chicago, Ill.
    Trenton, N. J.
    Covington, Ky.
    Saginaw, Mich.[11]
    Bay City, Mich.[12]
  b. By contractors—
    Newark, N. J.
    Paterson, N. J.[9]
    York, Pa.
III. Cities having collections twice a week:
  a. By city employees—
    Cleveland, Ohio.[13]
    Detroit, Mich.[14]
    Cincinnati, Ohio.
    Fall River, Mass.[10]
    Grand Rapids, Mich.[15]
    Spokane, Wash.[16]
    Camden, N. J.
    Holyoke, Mass.[10]
    Bayonne, N. J.
    Haverhill, Mass.[10]
    Knoxville, Tenn.
  b. By contractors—
    Buffalo, N. Y.[17]
    Washington, D. C.
    Harrisburg, Pa.[17]
    Chester, Pa.
IV. Cities having collections once a week:
  a. By city employees—
    Minneapolis, Minn.[1]
    Syracuse, N. Y.
    Scranton, Pa
    Richmond, Va.
    Lowell, Mass.
    Cambridge, Mass.[2]
    New Bedford, Mass.
    Lynn, Mass.
    Wilmington, Del.
    Lawrence, Mass.
    Yonkers, N. Y.
    Somerville, Mass.
    Savannah, Ga.
    Brockton, Mass.
    Jacksonville, Fla.
    Malden, Mass.
    Salem, Mass.
    Newton, Mass.
    Everett, Mass.
    Newport, Ky.
  b. By contractors—
    Hartford, Conn.
    Taunton, Mass.
    Chelsea, Mass.

Collection of rubbish.—Of the 158 cities covered by this investigation, rubbish was collected by city employees or city contractors in 86. In 32 it was collected separately; in 30 it was collected with ashes; in 5 a part (waste paper) was collected separately and a part with ashes; in Houston and Galveston, Tex., Salt Lake City, Utah, and Hoboken, N. J., it was collected with garbage; in New York, N. Y., a part was collected separately and a part with garbage and ashes. In 14 cities mentioned by name on page 40, all the rubbish was collected with garbage and ashes under the mixed system. In those cities operating incineration plants for the disposal of garbage, combustible rubbish was generally included with garbage; while incombustible rubbish, such as broken bottles, tin cans, metal scrap, etc., is included with ashes. In many cities some rubbish was collected by the street cleaning department in a general clean-up of the city at one or more seasons of the year, and of the quantity so collected or collected with ashes or garbage, no report was obtainable.

In 67 of the 86 cities in which rubbish was collected at the expense of the city, collections were made by city employees, and in 19 they were made by contractors with the city.

Daily collections of rubbish in the business sections were reported by 11 cities, in 8 of which there were less frequent collections in the residence portions. Savannah, Ga., and Pueblo, Colo., reported 3 collections per week for the entire city, while Holyoke, Mass., reported 3 per week in the business section, no report being made for the residence section. One collection per week for the entire city was reported for New Orleans, La.; Cambridge, Lawrence, and Somerville, Mass.; Jacksonville, Fla.; and Salem, Mass. Newton, Mass., and Nashville, Tenn., reported rubbish collected twice each month; Dayton, Ohio, once each month; Fitchburg, Mass., twice each year; Pittsburgh and Wilkes-Barre, Pa., once each year; and Spokane, Wash., only when ordered.

---

[1] In Borough of Queens, only 3 per week.
[2] In residence sections, 1 or 2 per week.
[3] During summer, 3 per week.
[4] In residence sections, 3 per week.
[5] Residence section: Winter, 1 per week; summer, 1 every 2 weeks.
[6] Uptown districts, 2 daily; other sections, from 3 to 6 per week.
[7] Suburban section, 1 every 2 weeks.
[8] Residence section, 1 to 3 per week.
[9] Residence section, 2 per week.
[10] Residence section, 1 per week.
[11] Winter months only.
[12] City collections made in winter only; some parts of city 4 per week.
[13] Residence section, every 2 weeks.
[14] During summer, 1 per week.
[15] On request in summer.
[16] Part of time only 1 per week.
[17] In winter, 1 per week.

[1] Residence section only.
[2] Large apartment houses, 2 per week.

Collection of dead animals.—The collection of dead animals was reported for all of the 158 cities covered by the report. In 68 they were collected by city employees; in 6 they were collected by both city employees and contractors, and in 84 they were collected by contractors.

Special equipment for the collection of dead animals was reported by 14 cities in which collections were made by city employees, and 33 cities in which they were made by contractors. It is likely that in some other cities for which a report was not obtained, specially constructed wagons were in use for this branch of the service, either by the city or by contractors.

The number of specially constructed carts and wagons reported as being owned by the cities and used for the collection and removal of dead animals was as follows: St. Louis, Mo., Baltimore, Md., Los Angeles, Cal., and Yonkers, N. Y., 2 each; Columbus, Ohio, Scranton, Pa., Grand Rapids, Mich., Dayton, Ohio, Spokane, Wash., San Antonio and Dallas, Tex., Oklahoma City, Okla., Covington, Ky., and Macon, Ga., 1 each.

The number of carts and wagons owned and used by contractors reported for the several cities was as follows: New York, N. Y., 21; Pittsburgh, Pa., 9; Dubuque, Iowa, 7; Cincinnati, Ohio, 5; Chicago, Ill., Washington, D. C., and Denver, Colo., 4 each; Minneapolis, Minn., Memphis, Tenn., and Pawtucket, R. I., 3 each; Kansas City, Mo., Indianapolis, Ind., New Bedford, Mass., St. Joseph, Mo., and Wheeling, W. Va., 2 each; Rochester, N. Y., Worcester and Fall River Mass., Bridgeport, Conn., Lynn, Mass., Kansas City, Kans., Waterbury, Conn., Hoboken, N. J., Harrisburg, Pa., Terre Haute, Ind., York, Pa., Lincoln, Nebr., Woonsocket, R. I., Galveston, Tex., Fitchburg, Mass., Knoxville, Tenn., West Hoboken, N. J., and Taunton, Mass., 1 each.

SORTING OF REFUSE.

Cities reporting the sorting of refuse.—Sorting of refuse was reported by 9 cities, the work being performed by city employees in 4—Cleveland, Ohio; Buffalo, N. Y.; and Cambridge and Somerville, Mass.—and by contractors in 5—Boston, Mass.; Washington, D. C.; Paterson, N. J.; Hartford, Conn.; and West Hoboken, N. J.

The sorting was done from conveyors in Boston, Mass., Buffalo, N. Y., and Washington, D. C., and by hand from dumps in the other 6 cities.

In West Hoboken, N. J., all kinds of refuse were sorted; in Cleveland, Ohio, rubbish and ashes were sorted; and in the remaining 7 cities, rubbish only was sorted.

The cubic yards of refuse sorted by picking from dumps was as follows:

Cleveland, Ohio	215,420
West Hoboken, N. J	39,000
Cambridge, Mass	23,435
Hartford, Conn	18,600
Paterson, N. J	6,200
Somerville, Mass	4,950

The cubic yards of refuse sorted by picking from conveyors was as follows:

Buffalo, N. Y	179,265
Washington, D. C	115,778
Boston, Mass	77,620

DISPOSAL OF REFUSE BY CITY EMPLOYEES AND CONTRACTORS.

Growing problem of refuse disposal.—With the increase in size of modern cities, the disposal of refuse has become a problem of no small magnitude. When the only cities were small and surrounded by large areas of waste and unoccupied land, refuse was simply hauled out to such land and dumped upon it, to assist in filling up depressions or to disappear by decay and erosion. This method of disposal is still employed to a considerable extent, particularly in the case of ashes and some forms of rubbish; but with the increase in the development of modern urban communities it has become necessary for most cities to dispose of at least a portion of their refuse by other methods. The six different methods which are now in use for such disposal, including the one mentioned above, are all described in the introduction to Part II on page 37.

The sanitary character of those methods differs widely; but so far as the public health is concerned the choice in method is chiefly one of expedience, depending upon local conditions, which should be determined by expert sanitary engineers.

In general, cities provided for the disposal of refuse collected by their employees, and also that collected by private arrangement of the householders, while the contractors collecting for the city in almost all cases disposed of the refuse collected by them.

Disposal of mixed refuse.—The 14 municipalities collecting a part or all of their garbage, ashes, and rubbish under what is known as the combined system are mentioned by name on page 40. Of the quantities collected and reported by such cities, city employees disposed of a total of 592,011 cubic yards. This is the quantity of all refuse collected by city employees except 125,865 cubic yards collected by city employees of Troy, N. Y., which was disposed of by contractors. In addition to disposing of the foregoing quantities collected by city employees, the cities of Superior, Wis., and Seattle, Wash., disposed of 59,006 cubic yards collected under private arrangement of householders. Contractors disposed of 772,499 cubic yards, including all collected by them and also the 125,865 cubic yards collected by city employees in Troy, N. Y.

All mixed refuse disposed of by them was dumped upon land. The quantities of mixed refuse disposed of by city employees by dumping upon land and by incineration are given in the statement which follows:

City number.	CITY.	CUBIC YARDS OF MIXED REFUSE DISPOSED OF BY CITY EMPLOYEES BY—	
		Dumping upon land.	Incineration.
	Total	386,491	264,526
1	New York, N. Y	52,022	20,833
23	Seattle, Wash		[1] 56,160
32	Atlanta, Ga	178,271	146,000
64	Troy, N. Y	15,600	
89	Charleston, S. C	[1] 42,442	
103	Mobile, Ala	[1] 8,220	
120	Chattanooga, Tenn	[1] 34,344	
122	Sacramento, Cal		[1] 26,563
131	Augusta, Ga	[1] 22,476	
132	Superior, Wis	[1] 2,846	
135	Butte, Mont	[1] 30,270	
147	Macon, Ga		[1] 14,970

[1] Includes all quantities of mixed refuse collected in city.

Disposal of garbage by city employees.—The 1,464,897 cubic yards of garbage collected by the separate system was disposed of by city employees in various ways, as follows: Incineration, 505,738; dumping upon land, 311,973; dumping into water, 221,681; feeding to swine, 196,200; burial, 157,981; reduction, 71,344. This does not include the quantity of garbage disposed of by incineration in Joliet, Ill., for which city no report was obtainable. In the following 19 cities all or part of the garbage disposed of by city employees was collected other than by city employees; mainly by contractors with the city; and in a few cases, small quantities by private arrangement of the householders:

Portland, Oreg.
Oakland, Cal.
Camden, N. J.
Dallas, Tex.
Youngstown, Ohio.
Duluth, Minn.
Evansville, Ind.
Fort Wayne, Ind.
Terre Haute, Ind.
Johnstown, Pa.
South Bend, Ind.
Allentown, Pa.
Canton, Ohio.
Binghamton, N. Y.
Sioux City, Iowa.
McKeesport, Pa.
Wheeling, W. Va.
Butte, Mont.
Woonsocket, R. I.

In Cleveland, Ohio, 71,344 cubic yards of garbage which was collected by city employees was reduced with dead animals.

The table which follows presents in parallel columns the quantity of garbage that was disposed of by city employees by the five other methods, namely, by incineration, by dumping upon land and into water, by feeding to swine, and by burial. The quantities disposed of by dumping upon land and into water are given in the same column, the quantities disposed of by dumping into water being indicated by footnotes. The table also indicates by footnote references whether refuse other than garbage was disposed of in connection with garbage.

City number.	CITY.	CUBIC YARDS OF GARBAGE DISPOSED OF BY CITY EMPLOYEES BY—			
		Incineration.	Dumping.	Feeding to swine.	Burial.
	Total	505,738	533,654	196,200	157,981
1	New York, N. Y	23,600	17,220		
4	St. Louis, Mo				79,293
13	Milwaukee, Wis	[1] 61,928		606	20,424
15	New Orleans, La		[2][3] 181,666		
17	Minneapolis, Minn	[1][2] 36,807			
18	Los Angeles, Cal	[1][2] 48,667			
22	Louisville, Ky		[2] 51,304		
23	Seattle, Wash		30,888		
26	St. Paul, Minn		[3] 11,031	8,289	
28	Portland, Oreg	[1] 16,241	1,840		
29	Columbus, Ohio				[2] 30,000
30	Toledo, Ohio		[2] 12,375		
31	Worcester, Mass			[2] 13,522	
35	Scranton, Pa	[2][4] 8,155			
39	Memphis, Tenn	[1][2] 28,780			
40	Richmond, Va	[4] 9,759	2,689		
41	Oakland, Cal		[2][3] 76,572		
42	Grand Rapids, Mich	[4] 3,957		20,043	
43	Nashville, Tenn		[3] 7,000	8,056	
44	Lowell, Mass	[4] 2,601		7,106	
45	Cambridge, Mass			[2] 26,330	
49	Spokane, Wash	[1][2] 27,280			
52	Trenton, N. J	[1][2] 20,552			
53	San Antonio, Tex		[2] 13,104		
55	Camden, N. J	[1][2] 576			
56	Dallas, Tex	[1][2] 16,425			
58	Lynn, Mass		[3] 558	11,533	
60	Springfield, Mass			[2] 8,489	
62	Lawrence, Mass			[2] 5,467	
65	Yonkers, N. Y	[1][2] 26,100			
67	Youngstown, Ohio	[2][4] 7,702			
68	Duluth, Minn	[2][4] 9,070			
69	Houston, Tex	[2][4] 51,480			
70	Somerville, Mass			[2] 11,850	
78	Evansville, Ind	[1] 2,759		438	
81	Norfolk, Va	[4] 10,256	3,798		
85	Savannah, Ga			[2] 53,226	
88	Fort Wayne, Ind	[1][2] 10,260			
90	Portland, Me			[2] 4,800	
91	Terre Haute, Ind	[1][2] 21,600			
92	East St. Louis, Ill		[2][3] 5,760		
94	Brockton, Mass			[2] 5,400	
95	Johnstown, Pa	[1][2] 10,300			
96	Jacksonville, Fla	[4] 5,958	[2] 72,324		
97	Oklahoma City, Okla		[2] 3,968		
98	Bayonne, N. J		[2] 5,928		
99	Covington, Ky	[1] 5,160			1,304
100	South Bend, Ind	[1] 10,527		992	
104	Allentown, Pa	[2] 8,750			
107	Canton, Ohio	[1][2] 5,360			
110	Binghamton, N. Y				[2] 2,000
112	Sioux City, Iowa		[2] 7,500		
123	Malden, Mass			[2] 3,302	
126	Salem, Mass			[2] 5,251	
128	Davenport, Iowa		[2][3] 15,657		
129	McKeesport, Pa	[2][4] 4,627			
130	Wheeling, W. Va	[1][2] 10,501			
135	Butte, Mont		[2] 1,062		
138	Montgomery, Ala		[2] 9,790		
140	Galveston, Tex				[2] 24,960
151	Taunton, Mass			[2] 1,500	
156	La Crosse, Wis		[2][3] 1,620		

[1] Dead animals incinerated with garbage.
[2] All garbage collected disposed of as indicated by column heading.
[3] Dumped into water.
[4] Dead animals and rubbish incinerated with garbage.

Canton, Ohio, and Covington, Ky., incinerated butchers' and market waste with garbage and dead animals; Lowell, Mass., and McKeesport, Pa., incinerated them with garbage, dead animals, and rubbish; and Lowell, Mass., also incinerated gypsy and other moths that had been collected in the work of extermination. New York, N. Y., incinerated rubbish with garbage. Where dead animals were incinerated with garbage, or with any other class of refuse, these were in most cases small animals only. Garbage was incinerated separately in Allentown, Pa., only. In San Antonio, Tex., garbage was burned in the open air at the city dumps, together with other combustible refuse. The incineration of the garbage was not complete, and for that reason it is shown in the preceding text table as dumped upon land.

In no less than 23 of the 63 cities in which garbage was disposed of by city employees the practice of dumping prevails. A report of the quantity dumped for Woonsocket, R. I., could not be procured. For the remaining 22 cities the data are presented in the preceding table. Fourteen cities, marked "(2)," disposed of all garbage by dumping; 14 cities dumped upon land; and 8, marked "(3)," into water; one of these, New Orleans, dumped both upon land and into water, 78,183 cubic yards of garbage being dumped upon land and 103,483 into water. Of the cities dumping into water Lynn, Mass., and Oakland, Cal., dumped into the ocean, the garbage being carried out to sea, 1.6 miles in the case of Lynn and 5.5 miles in the case of Oakland; in the case of other cities dumping into water the dumping was into rivers. Of the 8 cities dumping into water 4 made use of scows of number and capacity in cubic yards as follows: New Orleans, La., 3 scows of 40 cubic yards capacity; Oakland, Cal., 1 scow of 500 cubic yards capacity; Lynn, Mass., 2 scows of 200 cubic yards capacity; East St. Louis, 2 scows of unreported capacity. The scows reported for New Orleans and Lynn were automatic in their action.

In 11 of the 19 cities shown in the foregoing table in which collections were made by the city, all garbage was fed to swine. It does not follow, however, that each city maintained a hog farm. In most cases the garbage was merely hauled by the city to some conveniently located dump shed, from which it was regularly hauled away by farmers.

Disposal by burial is not sharply differentiated from disposal by dumping upon land. Often portions of that which is dumped is covered over with a thin layer of earth. But where garbage was reported as "buried" the presumption is that it was placed in trenches and covered over. Garbage was reported as buried in 6 cities, with quantities stated in the preceding table.

Disposal of garbage by contractors.—In 53 cities 2,713,038 cubic yards of garbage collected by the separate system were disposed of by contractors, as follows: In 25 cities by reduction; in 18, by feeding to swine; in 7, by dumping; and in 5 by incineration. In Newport, Ky., 2,372 cubic yards, and in Troy, N. Y., 361 cubic yards, were disposed of by burial, and in Utica, N. Y., 3,886 cubic yards were disposed of by some method not reported. The quantities disposed of by reduction, feeding to swine, dumping, and incineration are shown in the table which follows, the quantities disposed of by dumping upon land and into water being given in the same column, and those dumped into water indicated by footnotes. In all these cities except Chicago, Ill., Baltimore, Md., Syracuse, N. Y., Dayton, Ohio, St. Louis, Mo., and Troy, N. Y., all garbage was also collected by contract.

[NOTE.—Quantities in italics are estimates.]

City number	CITY.	CUBIC YARDS OF GARBAGE DISPOSED OF BY CONTRACTORS BY—			
		Reduction.	Incineration.	Feeding to swine.	Dumping.
	Total	2,346,692	30,267	251,736	77,724
1	New York, N. Y	[1] 577,228			
2	Chicago, Ill	[1] 186,536			
3	Philadelphia, Pa	651,360			
4	St. Louis, Mo	2,230			
5	Boston, Mass	92,151		13,444	
6	Baltimore, Md	[1] 152,608			
8	Pittsburgh, Pa	[1] 136.004			
9	Detroit, Mich	50,260			
10	Buffalo, N. Y	50,564			
12	Cincinnati, Ohio	53,694			
14	Newark, N. J	38,706			
16	Washington, D. C	72,110			
20	Kansas City, Mo			21,345	[2] 35,083
21	Indianapolis, Ind	[1] 48,000			
24	Providence, R. I			[1] *32,416*	
25	Rochester, N. Y	[1] 66,329			
27	Denver, Colo			[1] 80,392	
33	Syracuse, N. Y	[1] 23,264			
34	New Haven, Conn			[1] *27,000*	
36	Paterson, N. J	14,400			
38	Fall River, Mass				[1] 5,000
46	Dayton, Ohio	[1] 15,891			
48	Bridgeport, Conn	[1] 15,625			
50	Hartford, Conn			17,275	17,100
51	Reading, Pa	14,048			
54	New Bedford, Mass	[1] 11,411			
59	Wilmington, Del	9,288			
64	Troy, N. Y		1,083		
72	Utica, N. Y	14,085			
73	Waterbury, Conn		[1,3] 13,904		
77	Manchester, N. H			[1] 1,050	
83	Wilkes-Barre, Pa		1,627		
87	Harrisburg, Pa	[1] 16,500			
90	Portland, Me			3,750	
93	Holyoke, Mass			[1] 2,806	
105	Pawtucket, R. I			[1] 6,400	
111	Lancaster, Pa		[1] 7.200		
114	Springfield, Ohio				[1] 1,728
115	Atlantic City, N. J	[1] 22,400			
117	Rockford, Ill				[1] 8,064
118	York, Pa	[1] 12,000			
124	Haverhill, Mass			[1] *9,179*	
127	New Britain, Conn			[1] 5,616	
133	Newton, Mass			[1] 6,060	
134	Dubuque, Iowa			[1] 2,995	
136	Chester, Pa			[1] 8,013	
141	Fitchburg, Mass			[1] 5,440	
144	Quincy, Ill				[1,2] 6,576
146	New Castle, Pa		6,453		
148	Auburn, N. Y				[1] 4,173
152	Everett, Mass			[1] 4,882	
154	Chelsea, Mass			[1] 3,674	

[1] All garbage disposed of as indicated by column heading.
[2] Dumped into water.
[3] Dead animals incinerated with garbage.

Disposal of ashes.—All ashes collected by the separate method, whether by city employees or by contractors, were disposed of by dumping upon land. The quantities thus collected and disposed of are shown in Table 12, in the column with the heading "Ashes."

Disposal of rubbish.—All or part of the rubbish collected or disposed of at the expense of the city was disposed of independently of other refuse in 46 of the 158 cities included in the report. City employees disposed of all rubbish collected by the separate method in 39 cities, and contractors disposed of all so collected in 7 cities. Both city employees and contractors disposed of rubbish collected by the separate method in Boston, Mass. Rubbish disposed of by city employees was collected by the separate method by city employees in 29 cities; by private agencies at the expense of householders in the following 10 cities: Seattle, Wash.; Scranton, Pa.; Albany, N. Y.; Youngstown, Ohio; Duluth,[1] Minn.; Binghamton, N. Y.; McKeesport, Pa.; Butte, Mont.; Woonsocket, R. I.; and Quincy, Ill.; and by a contractor in Buffalo, N. Y. For the following 3 cities no report of the quantity of rubbish disposed of could be obtained: Albany, N. Y.; Woonsocket, R. I.; and Quincy, Ill. The total quantity reported as disposed of by city employees was 1,156,701 cubic yards; and by contractors, 358,723 cubic yards.

The quantity of rubbish disposed of separately by various methods is given in the table which follows, so far as information relating to the disposal was received. Rubbish collected by the separate system, where the method of its disposal is not especially mentioned in the table, was practically all disposed of by being dumped upon the land with ashes.

City number.	CITY.	CUBIC YARDS OF RUBBISH DISPOSED OF BY—		
		Incineration by city employees.	Dumping on land—	
			By city employees.	By contractors.
	Total	535,265	472,029	136,725
1	New York, N. Y	[2] 118,478	69,904	
3	Philadelphia, Pa			107,780
5	Boston, Mass	77,620	[3] 22,355	
8	Pittsburgh, Pa		[4] 27,845	
14	Newark, N. J			8,235
15	New Orleans, La		[4] 36,334	
18	Los Angeles, Cal		[4] 10,139	
21	Indianapolis, Ind			10,910
22	Louisville, Ky		[4] 17,548	
23	Seattle, Wash	[5] 33,381	100,152	
35	Scranton, Pa	[4] [5] 36,364		
36	Paterson, N. J			6,200
40	Richmond, Va	[5] 53,895	37,726	
42	Grand Rapids, Mich	[4] [5] 36,500		
43	Nashville, Tenn		[4] 5,488	

[1] Except 150 cubic yards which were collected by the city.

[2] Including 89,904 cubic yards incinerated separately in the Borough of Manhattan and 28,574 cubic yards incinerated with garbage in the Borough of Queens.

[3] Includes 5,500 cubic yards which were dumped in water.

[4] All rubbish separately collected was disposed of as indicated by column heading.

[5] Incinerated with garbage.

City number.	CITY.	CUBIC YARDS OF RUBBISH DISPOSED OF BY—		
		Incineration by city employees.	Dumping on land—	
			By city employees.	By contractors.
45	Cambridge, Mass	[1] 23,435		
49	Spokane, Wash	[1] 6,975		
56	Dallas, Tex		[1] 32,400	
57	Salt Lake City, Utah	[1] 8,488		
62	Lawrence, Mass	[1] 9,480		
67	Youngstown, Ohio	[1] [2] 3,200		
68	Duluth, Minn	[1] [2] 7,465		
70	Somerville, Mass	[1] 4,950		
76	Hoboken, N. J			3,600
81	Norfolk, Va	[2] 83,040	3,120	
83	Wilkes-Barre, Pa		[1] 373	
85	Savannah, Ga		[1] 2,853	
93	Holyoke, Mass		[1] 600	
96	Jacksonville, Fla	[1] [2] 7,260		
97	Oklahoma City, Okla		12,400	
110	Binghamton, N. Y		[1] 2,000	
125	Pueblo, Colo		[1] 200	
126	Salem, Mass	324		
129	McKeesport, Pa	[1] [2] 6,266		
133	Newton, Mass	[1] 18,144		
135	Butte, Mont		[1] 7,100	
138	Montgomery, Ala		[1] 58,742	
141	Fitchburg, Mass		[1] 1,700	
145	Knoxville, Tenn		[1] 22,960	

[1] All rubbish separately collected was disposed of as indicated by column heading.

[2] Incinerated with garbage.

Disposal of waste paper.—The waste paper included with the rubbish collected by the separate method by city employees was sold by 6 cities in amounts as follows:

City number.	CITY.	Cubic yards.
	Total	47,762
7	Cleveland, Ohio	[1] 12,668
40	Richmond, Va	1,776
58	Lynn, Mass	[1] 7,698
81	Norfolk, Va	13,100
97	Oklahoma City, Okla	12,400
126	Salem, Mass	120

[1] All waste paper collected separately was sold.

The contractors in Washington, D. C., sold 115,778 cubic yards of waste paper.

Disposal of dead animals.—The quantity of dead animals disposed of by city employees and by contractors by various methods are given in the table which follows.

[NOTE.—Figures in italics are estimates.]

City number.	CITY.	TONS OF DEAD ANIMALS DISPOSED OF.					
		Reduced by—		Incinerated by—		Buried by—	
		City employees.	Contractors.	City employees.	Contractors.	City employees.	Contractors.
	Total	65	33,443	2,704	1,454	514	783
1	New York, N. Y		10,733				
2	Chicago, Ill		3,187				
3	Philadelphia, Pa		84				
4	St. Louis, Mo		2,690				
5	Boston, Mass		2,100				
6	Baltimore, Md		*67*				
7	Cleveland, Ohio	44					
8	Pittsburgh, Pa		*1,414*				
12	Cincinnati, Ohio		1,200				
13	Milwaukee, Wis	21		98			
14	Newark, N. J		505				
15	New Orleans, La		*800*				
16	Washington, D. C		402				
17	Minneapolis, Minn		110	2			
18	Los Angeles, Cal		*852*	*88*			
19	Jersey City, N. J		471				
20	Kansas City, Mo		1,387				
22	Louisville, Ky		360			12	
24	Providence, R. I		*210*				
25	Rochester, N. Y		600				
26	St. Paul, Minn		500				
27	Denver, Colo				1,380		
28	Portland, Oreg			276			
29	Columbus, Ohio					36	
30	Toledo, Ohio		107				
31	Worcester, Mass		107				
32	Atlanta, Ga					*60*	
33	Syracuse, N. Y		4				
34	New Haven, Conn					3	
35	Scranton, Pa			3			
36	Paterson, N. J					1	
38	Fall River, Mass		300				
39	Memphis, Tenn		275	32			
40	Richmond, Va		*58*	*41*			
41	Oakland, Cal		*7*			9	
42	Grand Rapids, Mich			*10*			
43	Nashville, Tenn		*425*				
45	Cambridge, Mass		*225*				
46	Dayton, Ohio		219				
47	Albany, N. Y		*140*				
48	Bridgeport, Conn		156				
49	Spokane, Wash			*473*			
50	Hartford, Conn						160
51	Reading, Pa					15	
52	Trenton, N. J			*2*			
53	San Antonio, Tex			[1] 240			
54	New Bedford, Mass		*181*				
55	Camden, N. J			*20*			
56	Dallas, Tex			*364*			
57	Salt Lake City, Utah			366			
58	Lynn, Mass		126			*3*	
60	Springfield, Mass		*180*				
61	Des Moines, Iowa					*4*	
62	Lawrence, Mass		*106*				
63	St. Joseph, Mo		187				
64	Troy, N. Y					11	
65	Yonkers, N. Y			146			
66	Tacoma, Wash		*162*				
68	Duluth, Minn			*5*			
70	Somerville, Mass						2
71	Kansas City, Kans		488				
72	Utica, N. Y		*275*				
73	Waterbury, Conn				68		
74	Elizabeth, N. J		125				
76	Hoboken, N. J		78				
77	Manchester, N. H					2	
79	Birmingham, Ala					126	
81	Norfolk, Va			7		1	
83	Wilkes-Barre, Pa		8		3	1	
87	Harrisburg, Pa		10				
88	Fort Wayne, Ind			*13*			
89	Charleston, S. C					122	
93	Holyoke, Mass		72				
94	Brockton, Mass		136				
95	Johnstown, Pa			*2*			
96	Jacksonville, Fla			181			
98	Bayonne, N. J		*40*			10	
99	Covington, Ky			74		11	
101	Passaic, N. J						2
102	Altoona, Pa					*2*	
103	Mobile, Ala						202
104	Allentown, Pa					2	
105	Pawtucket, R. I		102				
107	Canton, Ohio			1			
108	Wichita, Kans						15
111	Lancaster, Pa					5	
114	Springfield, Ohio		*50*				
115	Atlantic City, N. J		*20*				
116	Bay City, Mich		*43*				
117	Rockford, Ill		*40*				
118	York, Pa		*10*				
119	Lincoln, Nebr						20
120	Chattanooga, Tenn			4			
122	Sacramento, Cal			107			
123	Malden, Mass		18				
124	Haverhill, Mass		*70*				
127	New Britain, Conn						90
128	Davenport, Iowa		*200*				
129	McKeesport, Pa			56			
131	Augusta, Ga		87				
132	Superior, Wis						11
134	Dubuque, Iowa		68				
135	Butte, Mont			93			
136	Chester, Pa					*2*	
137	Kalamazoo, Mich		45			14	
138	Montgomery, Ala		120			11	
139	Woonsocket, R. I		63				
140	Galveston, Tex						85
141	Fitchburg, Mass					1	
144	Quincy, Ill		500				
145	Knoxville, Tenn						65
146	New Castle, Pa				3		
147	Macon, Ga					*48*	
149	West Hoboken, N. J		*54*				
151	Taunton, Mass						18
152	Everett, Mass		21				52
154	Chelsea, Mass		83				1
157	Newport, Ky					2	

[1] Incinerated at city dump in the open air.

The quantities of dead animals shown above do not include 16 tons dumped at sea at Lynn, Mass., 3 tons dumped into the river at Davenport, Iowa, nor 224 tons disposed of at Savannah, Ga., by unreported methods. Neither do they contain the quantities disposed of in 13 cities by contractors and in 11 cities by city employees, for which no information relating to the quantity collected nor method of disposal was reported. The 13 cities first referred to were: Detroit, Mich.; Indianapolis, Ind.; Syracuse, N. Y.; Lowell, Mass.; Wilmington, Del.; Evansville, Ind.; Peoria, Ill.; Terre Haute, Ind.; East St. Louis, Ill.; Sioux City, Iowa; Topeka, Kans.; Fitchburg, Mass.; and South Omaha, Nebr.

The 11 cities in which disposal was by city employees, but in quantity and by method not reported, were: Boston, Mass.; Detroit, Mich.; Youngstown, Ohio; Houston, Tex.; Evansville, and South Bend, Ind.; Saginaw, Mich.; Salem, Mass.; Elmira and Auburn, N. Y.; and Joliet, Ill.

COLLECTION AND DISPOSAL OF REFUSE UNDER PRIVATE ARRANGEMENT OF HOUSEHOLDER.

Refuse collected and disposed of at householder's expense.—Many cities pay nothing for refuse collection and disposal, and the payments reported by many other cities for this service are exclusively for inspection and regulation. Further, as has been mentioned on preceding pages, many cities collecting refuse collect only a part of the quantity produced in the city. In nearly every city business establishments and private houses may, and in many cities must, dispose of all or certain classes of refuse. Cities very generally do not remove refuse incident to building operations, wastes from slaughterhouses and markets, waste paper from mercantile houses, ashes from factories, and many cities do not remove garbage from hotels and restaurants.

For the fiscal year 1909 the collection of garbage was wholly under private arrangement of the householder, and hence free of cost to the city, in 45 cities; of ashes, in 73 cities; of rubbish (including waste paper), in 72 cities; and of dead animals, in 46 cities.

Cities with private arrangements for collecting garbage.—In the following 45 cities the collection and disposal of all garbage was under private arrangement of the householder:

San Francisco, Cal.
Seattle, Wash.
Portland, Oreg.
Omaha, Nebr.
Oakland, Cal.
Albany, N. Y.
Camden, N. J.
Dallas, Tex.
Des Moines, Iowa.
St. Joseph, Mo.
Tacoma, Wash.
Kansas City, Kans.
Schenectady, N. Y.
Akron, Ohio.
Fort Worth, Tex.
Wilkes-Barre, Pa.
Erie, Pa.
Peoria, Ill.
Johnstown, Pa.
Altoona, Pa.
Saginaw, Mich.
Canton, Ohio.
Wichita, Kans.
Springfield, Ill.
Binghamton, N. Y.
Little Rock, Ark.
Bay City, Mich.
Lincoln, Nebr.
Topeka, Kans.
Sacramento, Cal.
Pueblo, Colo.
McKeesport, Pa.
Superior, Wis.
Kalamazoo, Mich.
Montgomery, Ala.
Woonsocket, R. I.
Racine, Wis.
Elmira, N. Y.
Knoxville, Tenn.
New Castle, Pa.
Oshkosh, Wis.
Joplin, Mo.
South Omaha, Nebr.

In Dubuque, Iowa, and La Crosse, Wis., the collection of garbage was under private arrangement of the householder during the winter, but was by the city during the summer.

In 41 other cities a portion of the garbage collected was collected under private arrangement of the householders. In some of these licensed farmers did the collecting free of cost to the city or the householder for the privilege of feeding to swine, while in others householders had to pay for the removal. In most of these cities, so far as reported, only a small proportion of the total quantity produced was collected under private arrangement of the householders, except in Duluth, Minn., where the city had only one horse and wagon engaged in the collection; New Britain, Conn., where only about one-third was collected by the city; Taunton, Mass., where fully one-half was collected by the householders; Springfield, Ohio, where about one-fifth was so collected; and San Antonio, Tex., where half or more was so collected.

In most of those cities where the collections were made both by the city and the householder, the collection under private arrangement of the householders was in the business section only, though in Toledo, Ohio, Hartford, Conn., and Springfield, Ohio, it was mainly from the residential sections. In Rochester, N. Y., it was in various parts of the city, and in Lynn, Mass., it was in a small section only. In Haverhill, Mass., it was in the "compact part of the city."

In 24 of the 41 cities above referred to, hotels and restaurants were specifically required to provide for the removal of their garbage. These cities were:

Chicago, Ill.
Boston, Mass.
Buffalo, N. Y.
Cincinnati, Ohio.
Milwaukee, Wis.
Minneapolis, Minn.
Los Angeles, Cal.
Denver, Colo.
Columbus, Ohio.
Worcester, Mass.
Paterson, N. J.
Richmond, Va.
Nashville, Tenn.
Lowell, Mass.
Salt Lake City, Utah.
Troy, N. Y.
Manchester, N. H.
Fort Wayne, Ind.
Portland, Me.
South Bend, Ind.
Salem, Mass.
Wheeling, W. Va.
Butte, Mont.
Joliet, Ill.

In Minneapolis, Denver, Columbus, and Salem the requirement of collection by hotel and restaurant keepers extended to the entire city; for three cities, the section of city in which collected was not reported, and in the others the collection was in the business section only.

Regulations of private collection.—In nearly all cities where the collection of garbage was under private arrangement of the householder, the collection was made under the supervision and control of the board of health. The regulations governing the collection are in some cities embodied in rules laid down by the board of health; in other cities they are embodied in city ordinances. Regulations as to the kind of wagons to be used in the collection were reported for 17 cities, as follows:

Boston, Mass.
San Francisco, Cal.
Newark, N. J.
Los Angeles, Cal.
Providence, R. I.
Portland, Oreg.
Columbus, Ohio.
Syracuse, N. Y.
Paterson, N. J.
Oakland, Cal.
Cambridge, Mass.
Hartford, Conn.
Springfield, Mass.
Tacoma, Wash.
Altoona, Pa.
Springfield, Ohio.
Sacramento, Cal.

In the following cities there were limitations as to the time of day or days in the week when collections were to be made:

Chicago, Ill.
St. Louis, Mo.
Los Angeles, Cal.
Portland, Oreg.
Houston, Tex.
Binghamton, N. Y.

In the following cities there were regulations which required the removal of garbage a certain number of times per week.

Chicago, Ill.
Omaha, Nebr.
Troy, N. Y.
Johnstown, Pa.
Binghamton, N. Y.
Sioux City, Iowa.

In the following cities licenses were required for those making collections:

New York, N. Y.
Minneapolis, Minn.
Seattle, Wash.
St. Paul, Minn.
Lowell, Mass.
Cambridge, Mass.
Salt Lake City, Utah.
Springfield, Mass.
Tacoma, Wash.
Fort Worth, Tex.
Portland, Me.
Salem, Mass.
Taunton, Mass.

Cities with private arrangement for collecting ashes.—The removal of all ashes was under private arrangement of the householders in all of the 43 cities in which the removal of all garbage was by the householder, except Camden, N. J., Wilkes-Barre, Pa., Saginaw and Bay City, Mich., Knoxville, Tenn., and also in the following 35 cities:

St. Louis, Mo.
Pittsburgh, Pa.
Kansas City, Mo.
Providence, R. I.
St. Paul, Minn.
Denver, Colo.
Columbus, Ohio.
Toledo, Ohio.
Worcester, Mass.
New Haven, Conn.
Bridgeport, Conn.
Reading, Pa.
San Antonio, Tex.
Dallas, Tex.
Youngstown, Ohio.
Waterbury, Conn.
Evansville, Ind.
Fort Wayne, Ind.
Portland, Me.
Terre Haute, Ind.
South Bend, Ind.
Allentown, Pa.
Pawtucket, R. I.
Lancaster, Pa.
Atlantic City, N. J.
Rockford, Ill.
New Britain, Conn.
Wheeling, W. Va.
Dubuque, Iowa.
Galveston, Tex.
Quincy, Ill.
Auburn, N. Y.
Houston, Tex.
Davenport, Iowa.
La Crosse, Wis.

For 14 cities the reports specifically stated that a portion of the ashes produced were removed by the householders, and it is also probable that in nearly every other city some of the ashes produced were so removed.

In Bay City, Mich., all ashes were removed by householders except from November 1 to April 1, during which time they were collected by the street-cleaning department. In Wilkes-Barre, Pa., all ashes are removed by the householders except a small quantity at the spring clean up.

Cities with private arrangements for collecting rubbish.—The collection of rubbish was by the householders in all of the cities in which ashes were collected by the householders except Pittsburgh, Pa., Dallas, Tex., and Saginaw, Mich.; in addition, rubbish had to be disposed of by the householders in Scranton, Pa., and Lowell, Mass. In Chattanooga, Tenn., and Augusta, Ga., householders disposed of a part of their rubbish. Householders of many other cities undoubtedly disposed of certain classes of rubbish, but the data with reference thereto are incomplete.

Cities with private arrangements for collecting waste paper.—In the 12 following cities waste paper was reported as being collected under private arrangement of the householder:

Cleveland, Ohio.
St. Paul, Minn.
Columbus, Ohio.
Scranton, Pa.
Lowell, Mass.
Albany, N. Y.
Akron, Ohio.
Portland, Me.
Binghamton, N. Y.
Springfield, Ohio.
Rockford, Ill.
McKeesport, Pa.

Cities with private arrangements for collecting butchers' and market wastes.—Butchers' and market wastes form an almost negligible part of the refuse of every city. Most of these wastes are valuable to rendering plants because of the grease they contain, and it is probable that city-paid scavengers have no opportunity to collect them even where they are willing to do so. The markets of many cities have animal and vegetable wastes which the city governments refuse to remove, and in at least 87 of the 158 cities these wastes were removed by the market men. In New York City, meat, fish, and offal are removed free of cost by a contractor with the city.

Cities with private arrangements for collecting dead animals.—In 79 cities large or both large and small dead animals were collected free of cost to the city. In 46 of these cities they were collected under private arrangement of the householder, and in 33 by contractors with the city. Large dead animals are valuable to rendering plants, and cities with such plants located in or near them are either under no expense or very little expense for the removal of this class of refuse. The 46 cities in which large dead animals were collected under private arrangement of the householder are:

Cleveland, Ohio.
Buffalo, N. Y.
Seattle, Wash.
Columbus, Ohio.
New Haven, Conn.
Scranton, Pa.
Paterson, N. J.
Richmond, Va.
Grand Rapids, Mich.
Des Moines, Iowa.
Duluth, Minn.
Somerville, Mass.
Akron, Ohio.
Forth Worth, Tex.
Erie, Pa.
Portland, Me.
Terre Haute, Ind.
Johnstown, Pa.
Oklahoma City, Okla.
South Bend, Ind.
Altoona, Pa.
Pawtucket, R. I.
Canton, Ohio.
Wichita, Kans.
Springfield, Ill.
Sioux City, Iowa.
Little Rock, Ark.
Atlantic City, N. J.
Bay City, Mich.
Rockford, Ill.
Chattanooga, Tenn.
Topeka, Kans.
Pueblo, Colo.
Davenport, Iowa.
Superior, Wis.
Newton, Mass.
Dubuque, Iowa.
Chester, Pa.
Racine, Wis.
Quincy, Ill.
New Castle, Pa.
Auburn, N. Y.
Oshkosh, Wis.
La Crosse, Wis.
Newport, Ky.
South Omaha, Nebr.

REDUCTION PLANTS.

Number of plants and their work.—A total of 94 reduction plants was reported by 79 cities. Of these, 92 were owned by private parties and 2 by cities. A total of 33,443 tons of dead animals and 2,346,692 cubic yards of garbage were reported as reduced in privately-owned reduction works, including 17,661 tons of dead animals reduced separately, 690,390 cubic yards of garbage and 15,782 tons of dead animals reduced together; and 1,656,302 cubic yards of garbage reduced separately. A total of 71,344 cubic yards of garbage and 65 tons of dead animals were reported as reduced in plants owned or operated by the city. These figures are approximate, since many were based upon estimates, and no report whatever was obtainable for Columbus, Ohio; Lowell, Mass.; Peoria and East St. Louis, Ill.; and Salem and Fitchburg, Mass.

The following 10 cities each reported more than one reduction plant: St. Louis, Mo., reported 4, 3 for garbage and 1 for dead animals; New York, N. Y., and Newark, N. J., 3 each, 2 being for garbage and 1 for dead animals; Pittsburgh, Pa., 2, both being used for the reduction of both garbage and dead animals; and Washington, D. C., Rochester, N. Y., Dayton, Ohio, Boston, Mass., Providence, R. I., and Lowell, Mass., 2 each, 1 for garbage and 1 for dead animals.

Reduction plants operated by private parties.—The quantity of garbage and of dead animals reduced during the year 1909 in private reduction works for which a report was obtained, together with the daily capacity of the works, are given in the table which follows.

[NOTE.—Quantities in italics are estimates.]

City number.	CITY.	REDUCTION WORKS OF CONTRACTORS.		
		Daily capacity (cubic yards).	Tons of dead animals reduced during 1909.	Cubic yards of garbage reduced during 1909.
	Total	53,300	33,443	2,346,692
1	New York, N. Y	41,400	10,733	577,228
2	Chicago, Ill	1,200	3,187	186,536
3	Philadelphia, Pa	2,500	84	651,360
4	St. Louis, Mo	525	2,690	2,230
5	Boston, Mass	(1)	2,100	92,151
6	Baltimore, Md	576	67	152,608
8	Pittsburgh, Pa	640	1,414	136,004
9	Detroit, Mich	640	(1)	50,260
10	Buffalo, N. Y	300	....	50,564
12	Cincinnati, Ohio	400	1,200	53,694
14	Newark, N. J	*216*	505	38,706
15	New Orleans, La	....	800	....
16	Washington, D. C	*583*	402	72,110
17	Minneapolis, Minn	....	110	....
18	Los Angeles, Cal	7	*852*	....
19	Jersey City, N. J	....	471	....
20	Kansas City, Mo	*85*	1,387	....
21	Indianapolis, Ind	*240*	(1)	48,000
22	Louisville, Ky	*10*	360	....
24	Providence, R. I	....	210	....
25	Rochester, N. Y	217	600	66,320
26	St. Paul, Minn	....	500	....
30	Toledo, Ohio	....	107	....
31	Worcester, Mass	7	107	....
33	Syracuse, N. Y	*67*	4	23,264
36	Paterson, N. J	200	....	14,400
38	Fall River, Mass	....	*300*	....
39	Memphis, Tenn	10	275	....
40	Richmond, Va	....	*38*	....
41	Oakland, Cal	10	7	....
43	Nashville, Tenn	....	*425*	....
45	Cambridge, Mass	....	*235*	....
46	Dayton, Ohio	55	*219*	15,891
47	Albany, N. Y	....	*140*	....
48	Bridgeport, Conn	(1)	*156*	15,625
51	Reading, Pa	300	....	14,048
54	New Bedford, Mass	(1)	181	11,411
58	Lynn, Mass	....	126	....
59	Wilmington, Del	29	(1)	9,288
60	Springfield, Mass	....	180	....
62	Lawrence, Mass	....	*106*	....
63	St. Joseph, Mo	....	187	....
66	Tacoma, Wash	....	162	....
71	Kansas City, Kans	*85*	488	....
72	Utica, N. Y	50	275	14,085
74	Elizabeth, N. J	....	*125*	....
76	Hoboken, N. J	....	78	....
83	Wilkes-Barre, Pa	....	8	....
87	Harrisburg, Pa	55	10	16,500
91	Terre Haute, Ind	75	....	....
93	Holyoke, Mass	*17*	72	....
94	Brockton, Mass	113	136	....
98	Bayonne, N. J	....	40	....
105	Pawtucket, R. I	16	102	....
114	Springfield, Ohio	....	*50*	....
115	Atlantic City, N. J	2,400	*20*	22,400
116	Bay City, Mich	3	43	....
117	Rockford, Ill	*125*	*40*	....
118	York, Pa	75	10	12,000
123	Malden, Mass	....	18	....
124	Haverhill, Mass	....	70	....
128	Davenport, Iowa	2	*200*	....
131	Augusta, Ga	....	87	....
134	Dubuque, Iowa	48	68	....
137	Kalamazoo, Mich	10	45	....
138	Montgomery, Ala	....	120	....
139	Woonsocket, R. I	9	63	....
144	Quincy, Ill	....	*500*	....
149	West Hoboken, N. J	....	54	....
152	Everett, Mass	....	21	....
154	Chelsea, Mass	....	83	....

[1] Not reported.

Reduction plants operated by the city.—Only two cities—Cleveland, Ohio, and Milwaukee, Wis.—own and operate reduction plants. Wilmington, Del., owns a reduction plant, but it is operated by a contractor. The plant at Cleveland, with a daily capacity of 280 cubic yards, reduced 71,344 cubic yards of garbage and 44 tons of dead animals. The plant at Milwaukee, which is used for the reduction of dead animals only, and for which the daily capacity was not reported, reduced 21 tons of dead animals during the year.

INCINERATION PLANTS.

General statistics.—Plants for the incineration of refuse were reported by 48 cities. In 43 cities the plants were owned by the city, and by private parties in 5 cities; they were operated by city employees in 41 and by private parties in 7 cities. The total quantity of refuse incinerated was 1,335,796 cubic yards, of which 1,227,909 cubic yards (consisting of 457,645 cubic yards of rubbish, 505,738 cubic yards of garbage, and 264,526 cubic yards of refuse collected under the combined system) were incinerated in plants owned by cities, and 107,887 cubic yards (consisting of 77,620 cubic yards of rubbish and 30,267 cubic yards of garbage) in plants owned or operated by private parties. In addition to this, 3,918 tons of dead animals were reported as incinerated, of which 2,464 tons were incinerated in plants owned by the city, 1,454 tons in plants owned or operated by private parties, and 240 tons in the open air.

Details concerning the daily capacity of the incineration plants of the several cities, together with the quantity of refuse treated in 1909, are given in the table which follows. The cities in which the plants were operated or owned and operated by private parties are indicated by footnotes. In all cities not thus indicated the incineration plants were owned and operated by the city.

[NOTE.—Quantities in italics are estimates.]

City number.	CITY.	Daily capacity of incineration plants.	QUANTITIES INCINERATED: 1909		
			Garbage (cubic yards).	Rubbish (cubic yards).	Dead animals (tons).
	Total	7,849	527,857	535,265	3,805
1	New York, N. Y.	[1] 570	23,600	118,478	(2)
5	Boston, Mass.[3]	800	(2)	77,620	(2)
10	Buffalo, N. Y.	700	(2)	(2)	(2)
13	Milwaukee, Wis.	200	61,928	(2)	98
17	Minneapolis, Minn.	600	36,807	(2)	2
18	Los Angeles, Cal.	100	48,667	(2)	88
23	Seattle, Wash.	253	(2)	33,381	(2)
27	Denver, Colo.[3]	(2)	(2)	(2)	1,380
28	Portland, Oreg.	40	16,241	(2)	276
32	Atlanta, Ga.	400	(2)	(2)	(2)
35	Scranton, Pa.	175	8,155	36,364	3
39	Memphis, Tenn.	[4] 100	28,780	(2)	32
40	Richmond, Va.	[4] 100	9,759	53,895	41
42	Grand Rapids, Mich.	85	3,957	36,500	*10*
44	Lowell, Mass.	40	[5] 2,601	(2)	(2)
45	Cambridge, Mass.	600	(2)	23,435	(2)
49	Spokane, Wash.	100	27,280	6,975	473
52	Trenton, N. J.	100	20,552	(2)	2
55	Camden, N. J.	125	576	(2)	20
56	Dallas, Tex.	110	16,425	(2)	364
57	Salt Lake City, Utah	20	(2)	8,488	366
62	Lawrence, Mass.	(2)	(2)	9,480	(2)
64	Troy, N. Y.[3]	256	1,083	(2)	(2)
65	Yonkers, N. Y.	175	26,100	(2)	146
67	Youngstown, Ohio	48	*7,702*	*3,200*	(2)
68	Duluth, Minn.	266	9,070	7,465	5
69	Houston, Tex.	150	[6] 51,480	(2)	(2)
70	Somerville, Mass.	(2)	(2)	4,950	(2)
73	Waterbury, Conn.[7]	125	13,836	(2)	68
78	Evansville, Ind.	16	2,759	(2)	(2)
81	Norfolk, Va.	150	10,256	83,040	7
83	Wilkes Barre, Pa.[3]	60	....	(2)	....
88	Fort Wayne, Ind.	40	*10,260*	(2)	13
91	Terre Haute, Ind.	75	21,600	(2)	(2)
95	Johnstown, Pa.	(2)	10,300	(2)	2
96	Jacksonville, Fla.	90	5,958	7,260	181
99	Covington, Ky.	30	5,160	(2)	74
100	South Bend, Ind.	30	10,527	(2)	(2)
104	Allentown, Pa.	70	8,750	(2)	(2)
107	Canton, Ohio	24	5,360	(2)	1
111	Lancaster, Pa.[7]	128	7,200	(2)	(2)
120	Chattanooga, Tenn.	(2)	(2)	(2)	4
122	Sacramento, Cal.	135	(2)	(2)	(2)
126	Salem, Mass.	(2)	(2)	324	(2)
129	McKeesport, Pa.	80	4,627	6,266	56
130	Wheeling, W. Va.	60	[8] *10,501*	(2)	(2)
133	Newton, Mass.	(2)	....	18,144	....
135	Butte, Mont.	93	(2)	(2)	93
146	New Castle, Pa.[3]	30	....	(2)	....
147	Macon, Ga.	(2)	(2)	(2)	(2)
150	Joliet, Ill.	500	(2)	(2)	(2)

[1] Represents total capacity of eight plants; for details see text discussion. [2] Not reported. [3] Owned and operated by contractors. [4] Represents total capacity of two plants. [5] Market wastes only. [6] Includes rubbish and dead animals. [7] Owned by the city, but operated by contractor. [8] Includes dead animals.

With the exception of New York, N. Y., Memphis, Tenn., and Richmond, Va., no city owned and operated more than one plant. New York owned 8 plants, of which 5, with a total daily capacity of 200 cubic yards, were located in the Borough of Queens and used for the incineration of garbage and small dead animals; 2, with a total daily capacity of 250 cubic yards, were used for the incineration of rubbish from the Boroughs of Manhattan, Bronx, and Brooklyn; and 1, with a daily capacity of 120 cubic yards, was located in the Borough of Richmond and used for the incineration of garbage, ashes, and rubbish.

Refuse incineration plants operated by city.—The incineration plants operated by cities may be arranged in six classes: Those incinerating (1) rubbish only; (2) rubbish and dead animals; (3) rubbish and garbage; (4) rubbish, garbage, and dead animals; (5) rubbish, garbage, and ashes; and (6) garbage only.

The plants incinerating rubbish only were operated by 4 cities: New York, N. Y.; Cambridge, Mass.; Somerville, Mass.; and Buffalo, N. Y.

Salt Lake City, Utah, was the only city incinerating rubbish and dead animals.

New York, N. Y., was the only city incinerating rubbish and garbage, the plant for this purpose being one of eight operated by the city. It is located in the Borough of Queens.

The following five cities incinerated rubbish, garbage, and refuse collected together under the combined system in the following quantities: Atlanta, Ga., 146,000 cubic yards; Seattle, Wash., 56,160 cubic yards; Sacramento, Cal., 26,563 cubic yards; Borough of Richmond, New York, N. Y., 20,833 cubic yards; and Macon, Ga., 14,970 cubic yards. Total for five cities, 264,526 cubic yards.

Terre Haute, Ind., and Allentown, Pa., maintained incineration plants for treating garbage only. Chattanooga, Tenn., and Butte, Mont., maintained small plants for incinerating dead animals only. The plant in the latter city was an improved one.

HORSES EMPLOYED BY CITY IN ITS REFUSE-DISPOSAL SERVICE.

Statistics of horses employed.—The number of horses given in the table which follows does not include those employed by the city for the removal of dead animals. Further, the table includes figures for only those cities for which reasonably accurate information was obtained.

Of a total of 6,764 horses employed by the 78 cities included in the table, 2,553, or 37.7 per cent, were hired by the city, either together with teamsters who owned them or separately. An examination of the table discloses a greater relative proportion of horses hired by the larger than by the smaller cities in this particular branch of city service. Some cities, like Chicago, Ill.; Milwaukee, Wis.; New Orleans, La.; Minneapolis, Minn.; Los Angeles, Cal.; Rochester, N. Y.; and St. Paul, Minn., hired all horses used in the service, while other cities hired none. Where horses are hired, the prevailing practice is to hire them with the teamsters, and very frequently, also, with the wagon or carts—that is, as a complete outfit.

But a small proportion of the horses here tabulated were worked in teams, the larger number being used with single carts. This is indicated by the fact that the 6,764 horses were employed to draw 5,974 wagons or carts.

NUMBER OF HORSES EMPLOYED IN REFUSE DISPOSAL SERVICE OF CITIES: 1909.

City number.	CITY.	NUMBER OF HORSES OWNED AND HIRED BY CITY.		
		Total.	Owned.	Hired.
	78 cities	6,764	4,211	2,553
1	New York, N. Y	1,910	1,812	98
2	Chicago, Ill	1,164	....	1,164
4	St. Louis, Mo	226	226	....
5	Boston, Mass	293	293	....
6	Baltimore, Md	181	181	....
7	Cleveland, Ohio	214	118	96
9	Detroit, Mich	65	....	65
12	Cincinnati, Ohio	140	140	....
13	Milwaukee, Wis	232	....	232
15	New Orleans, La	120	....	120
17	Minneapolis, Minn	60	....	60
18	Los Angeles, Cal	68	....	68
22	Louisville, Ky	112	10	102
25	Rochester, N. Y	126	....	126
26	St. Paul, Minn	50	....	50
29	Columbus, Ohio	49	49	....
30	Toledo, Ohio	40	40	....
31	Worcester, Mass	42	42	....
32	Atlanta, Ga	183	183	....
33	Syracuse, N. Y	60	....	60
35	Scranton, Pa	38	38	....
38	Fall River, Mass	16	16	....
39	Memphis, Tenn	67	67	....
40	Richmond, Va	39	39	....
42	Grand Rapids, Mich	35	35	....
43	Nashville, Tenn	34	34	....
44	Lowell, Mass	34	34	....
45	Cambridge, Mass	50	49	1
46	Dayton, Ohio	40	....	40
49	Spokane, Wash	27	27	....
52	Trenton, N. J	32	32	....
53	San Antonio, Tex	52	2	50
54	New Bedford, Mass	16	16	....
55	Camden, N. J	14	14	....
56	Dallas, Tex	3	3	....
57	Salt Lake City, Utah	38	....	38
58	Lynn, Mass	42	42	....
60	Springfield, Mass	25	25	....
62	Lawrence, Mass	38	38	....
64	Troy, N. Y	52	....	52
65	Yonkers, N. Y	42	30	12
68	Duluth, Minn	1	1	....
69	Houston, Tex	21	....	21
70	Somerville, Mass	34	34	....
78	Evansville, Ind	14	14	....
79	Birmingham, Ala	50	50	....
81	Norfolk, Va	36	36	....
83	Wilkes-Barre, Pa	1	....	1
85	Savannah, Ga	68	68	....
89	Charleston, S. C	29	29	....
90	Portland, Me	8	8	....
92	East St. Louis, Ill	30	....	30
93	Holyoke, Mass	16	16	....
94	Brockton, Mass	21	21	....
96	Jacksonville, Fla	39	39	....
97	Oklahoma City, Okla	23	23	....
98	Bayonne, N. J	12	12	....
99	Covington, Ky	11	11	....
100	South Bend, Ind	6	....	6
103	Mobile, Ala	13	13	....
114	Springfield, Ohio	4	4	....
120	Chattanooga, Tenn	25	25	....
123	Malden, Mass	17	17	....
124	Haverhill, Mass	8	8	....
125	Pueblo, Colo	2	2	....
126	Salem, Mass	7	7	....
128	Davenport, Iowa	14	....	14
131	Augusta, Ga	15	15	....
135	Butte, Mont	26	....	26
138	Montgomery, Ala	29	29	....
140	Galveston, Tex	15	....	15
141	Fitchburg, Mass	30	30	....
145	Knoxville, Tenn	19	19	....
147	Macon, Ga	18	18	....
151	Taunton, Mass	2	2	....
152	Everett, Mass	9	9	....
156	La Crosse, Wis	6	....	6
157	Newport, Ky	16	16	....

EXPENSES OF REFUSE-DISPOSAL SERVICE.

Source of financial data.—The payments for the expenses of the refuse-disposal service of 120 cities shown in Table 12 are taken unchanged from the census report of financial statistics of cities having a population of 30,000 and over for 1909, except that in the case of a few cities the cost of collecting and disposing of dead animals has been deducted. The amounts so deducted are similarly shown in a text table on page 52.

Average costs of refuse-disposal service.—The average payments for the refuse-disposal service per 1,000 inhabitants and per 1,000 cubic yards of refuse collected, sorted, and disposed of, given in the last two columns of the table, show great variations for individual cities, and smaller variations for the groups of cities arranged according to population. Those averages are smallest in the groups of cities having the least population, and are largest in the groups of cities with the largest population, rising from the lowest in an irregular series. The average cost of collecting, sorting, and disposing of refuse per 1,000 inhabitants served and per 1,000 cubic yards collected depends, as does the average quantity per 1,000 inhabitants, upon many factors.

One of these is the proportion which the refuse handled by the city is of the entire quantity produced, as has been explained on page 39.

Another element producing differences in the average cost per 1,000 inhabitants, as well as in the reported average quantity of refuse collected per employee of city or contractors, is the relative proportion of the different classes of refuse collected, sorted, and disposed of. The collection and disposal of garbage requires a much larger expenditure per unit of service than that for collecting other refuse. This higher average cost of collecting garbage is shown by the following table, based on the experience of 17 cities for which were reported the quantities of garbage and other refuse collected, and the costs of collection in each case:

City number.	CITY.	QUANTITIES (CUBIC YARDS) COLLECTED.		PAYMENTS FOR SERVICES IN COLLECTING AND DISPOSING OF—	
		Garbage.	Ashes and rubbish.	Garbage.	Ashes and rubbish.
	Total	345,437	1,194,038	$559,556	$553,388
7	Cleveland, Ohio	71,344	215,420	193,069	119,981
13	Milwaukee, Wis	82,744	217,000	139,790	160,737
21	Indianapolis, Ind	48,000	110,910	52,632	34,985
45	Cambridge, Mass	26,330	122,901	39,769	40,152
50	Hartford, Conn	34,375	83,700	13,555	21,230
54	New Bedford, Mass	11,411	84,240	25,500	24,268
58	Lynn, Mass	12,091	76,228	22,822	27,929
59	Wilmington, Del	9,288	52,000	18,864	14,234
60	Springfield, Mass	8,489	39,839	18,747	35,815
93	Holyoke, Mass	2,806	41,600	1,676	24,988
124	Haverhill, Mass	9,179	30,000	2,925	8,894
126	Salem, Mass	5,251	19,017	12,131	4,250
133	Newton, Mass	6,060	60,468	6,533	16,320
136	Chester, Pa	8,013	6,500	3,700	4,200
151	Taunton, Mass	1,500	7,500	1,728	2,776
152	Everett, Mass	4,882	15,075	2,736	6,338
154	Chelsea, Mass	3,674	11,640	3,379	6,291

The average cost of collecting and disposing of a cubic yard of garbage in the 17 cities was $1.62, while that for collecting, sorting, and disposing of a cubic yard of ashes and rubbish was only $0.46. It can be seen, therefore, that no consideration of the average cost of refuse-collection service per 10,000 cubic yards removed, or 1,000 inhabitants, has any significance unless consideration is taken of the relative quantities of refuse removed.

Another factor affecting the average payments shown in the last two columns of the table, but not affecting the other averages of the table, is the varying distances that the refuse is hauled in the different cities. As a general thing this distance increases with the size of the city, but to this general rule there are a number of marked exceptions, one being Jersey City, N. J., in which the short haul required for disposing of the ashes so lessened the number of persons employed and the cost of the service as to measurably affect the averages of the group of cities in which Jersey City is included.

Cost of removing dead animals.—As far as it was possible to ascertain the payments made for the removal of dead animals, such payments have been excluded from the total cost reported for refuse disposal and are given in the following statement:

City number.	CITY.	Payments for removal of dead animals.
18	Los Angeles, Cal	$2,751
27	Denver, Colo	900
26	St. Paul, Minn	3,112
46	Dayton, Ohio	1,800
57	Salt Lake City, Utah	230
70	Somerville, Mass	104
88	Fort Wayne, Ind	684
89	Charleston, S. C	120
98	Bayonne, N. J	167
103	Mobile, Ala	58
124	Haverhill, Mass	158
135	Butte, Mont	15
152	Everett, Mass	124

REVENUES FROM REFUSE DISPOSAL.

Cities obtaining revenues from refuse disposal.—Each of the following cities received revenues in excess of $1,000 by the disposal of household refuse:

City number.	CITY.	Amount.	City number.	CITY.	Amount.
7	Cleveland, Ohio	$153,849	44	Lowell, Mass	$5,571
1	New York, N. Y	64,450	60	Springfield, Mass	4,165
10	Buffalo, N. Y	31,265	26	St. Paul, Minn	3,445
31	Worcester, Mass	29,157	14	Newark, N. J	2,975
45	Cambridge, Mass	13,101	126	Salem, Mass	2,039
94	Brockton, Mass	9,406	18	Los Angeles, Cal	2,000
90	Portland, Me	8,759	123	Malden, Mass	1,860
70	Somerville, Mass	8.731	151	Taunton, Mass	1,684
58	Lynn, Mass	7,499	42	Grand Rapids, Mich	1,103

From the operation of its garbage-disposal plant Cleveland, Ohio, received $107,295 from sales of grease, $32,639 from sales of fertilizer, and $10,521 from sales of ashes and rubbish. From the sales of garbage Somerville, Mass., received $8,731; Lynn, Mass., $7,017; Springfield, Mass., $4,133; Brockton, Mass., $3,882; and St. Paul, Minn., $3,445. From sales of pigs Brockton, Mass., received $5,379. Most of the revenues reported by other Massachusetts cities came from sales of garbage. The revenue reported by Buffalo, N. Y., was derived from sales of rubbish.

The following 13 cities in addition to the five mentioned in the preceding paragraph reported revenue receipts from sales of garbage:

Cleveland, Ohio.
Worcester, Mass.
Lowell, Mass.
Cambridge, Mass.
Lawrence, Mass.
Evansville, Ind.
Savannah, Ga.
Portland, Me.
Johnstown, Pa.
Malden, Mass.
Salem, Mass.
McKeesport, Pa.
Taunton, Mass.

The following 11 cities received revenue from sales of waste paper:

Cleveland, Ohio.
Cincinnati, Ohio.
Richmond, Va.
Lowell, Mass.
Hartford, Conn.
Lynn, Mass.
Lawrence, Mass.
Somerville, Mass.
Norfolk, Va.
Oklahoma City, Okla.
Salem, Mass.

Revenue from ashes was received by the following 6 cities:

Boston, Mass.	Evansville, Ind.
Grand Rapids, Mich.	Norfolk, Va.
Lynn, Mass.	Haverhill, Mass.

Revenue from rubbish was received by New York, N. Y.; Cleveland, Ohio; Buffalo, N. Y.; Cincinnati, Ohio; Cambridge, Mass.; and Spokane, Wash.

Wheeling, W. Va., and Macon, Ga., received revenue from sales of hides and scrap iron; New York City, from sales of meat, fish, and offal; and Boston, Mass., from market wastes.

For the privilege of removing dead animals, Chicago, Ill., received $25; Newark, N. J., $2,975; Los Angeles, Cal., $2,000; Pawtucket, R. I., $300; and Toledo, Ohio, $1.50 for each large animal removed. Other cities receiving revenue from the disposal of dead animals were New York, N. Y.; St. Paul, Minn. ($1,210); Portland, Oreg.; Spokane, Wash.; Savannah, Ga.; McKeesport, Pa.; and Augusta, Ga. ($306).

Several cities derive revenue in an indirect way from refuse disposal, but the information elicited by the Census schedules on this subject is only fragmentary.

The heat generated by the burning of rubbish in Buffalo, N. Y., was utilized in the operation of a sewage pumping station, and that generated by the incineration of garbage in Minneapolis, Minn., was used for heating and lighting the city workhouse and tuberculosis hospital.

PART III.—STREET-CLEANING SERVICE.

DEFINITIONS, METHODS, AND NECESSITY OF SERVICE.

Definitions.—The term *street-cleaning service* is used in this report as the generic designation of that branch of municipal service that comprises (1) the regular and occasional removal from the surface of streets and alleys of vegetable, animal, and mineral substances that have accumulated in such streets and alleys in connection with their use as highways; (2) the disposal of the substances thus removed; (3) the removal from the paved streets and sidewalks of the snow and ice that has fallen or formed thereupon, together with the disposal of such snow and ice; and (4) the administration of the several classes of operations above mentioned. The operations described above by the four numbered phrases are referred to in this report as *street cleaning, disposal of street cleanings, snow and ice removal and disposal,* and *administration of the street-cleaning service,* respectively.

Street cleaning comprises all regular and occasional cleaning of streets and alleys by sweeping, raking, flushing, or washing. It includes the sprinkling of streets and alleys with water to lay the dust preliminary to their being swept or washed, but includes no other sprinkling with water or other substances, all other sprinkling being included as part of the dust prevention of the street and general highway service. It includes the raking and sweeping of streets and alleys to remove refuse that has fallen upon them, but not the removal from streets and alleys of ashes and other refuse that has been deposited there by householders, nor the raking of back and vacant lots to remove therefrom the refuse that has there been accumulated, such work being part of the refuse-disposal service.

Necessity for street cleaning.—Street refuse, if unremoved, injuriously affects pavements. In times of rain it becomes very disagreeable to travelers, and when dry and reduced to dust by street travel, it is readily blown about by the wind and enters stores and residences with injurious effects. In addition, the street dust contains disease germs and is a potential cause of the diseases of the nasal passages, throat, and lungs. Moreover, the animal matter deposited in the streets, by becoming a breeding place for flies, may, if unremoved, assist in spreading typhoid fever. Street cleaning thus relates itself to public cleanliness and public health as does refuse disposal; and hence in a functional classification of municipal services must be treated as a part of the division of health conservation or sanitation, although, as has been pointed out on page 16 of the Introduction, the street-cleaning service is under the same administration as the highways in 137 of the 158 cities covered by this report.

The menace of street dust to public health is clearly brought out in the 1911 report of the commissioner of street improvement in the city of Cambridge, Mass., in the following language:

> The relation of street dust to public health is of great importance. Upon a moment's reflection it will be evident that our streets are receptacles for vast numbers of organisms of various kinds. Under proper conditions many of these may cause disease. The tubercle bacillus contained in the sputum of persons suffering from tuberculosis frequently reaches the streets and is undoubtedly present in much of the accumulation of street filth. While there is little, if any, direct evidence that specific cases of disease have been caused by street dust, it is quite generally recognized that throat and other troubles follow periods during which dust is prevalent. Dr. E. W. Hope [1] has compiled statistics with a view to presenting circumstantial evidence that street dust has caused infantile diarrhea. He attempts to show a relation between rainfall and mortality from this disease. The statistics are given in the following tabulation:

PERIOD.	Average rainfall, June to September, in inches.	Conditions.	Annual average of deaths from diarrhea during third quarter of year.
6 years	13.8	Average wet summer	373
14 years	10.9	Average dry summer	573
Extreme years—			
1891	16.0	Wettest summer	203
1895	7.7	Driest summer	819

> In Science [2] Dr. Sedgwick records that "10 liters of air taken 5 feet above the surface of a macadamized street in a dust storm contains as many as 200,000 microorganisms." Such statistics and research throw much light upon the possibility of a direct connection between dust and disease. It is not necessary in this report to go into great detail in this matter. It is, however, important in any report upon the improvement of city streets to point out the dangers of the dust nuisance. Much can be done to prevent dust by a proper and thorough cleaning of the streets. Another important method of dust prevention is the application of oil to the street surfaces. This is a recent practice, but it has already demonstrated its value. Every effort should be made to reduce the danger from street dust to the minimum, both by so constructing streets that the least amount of dust will arise from them and by adopting the most approved methods of street cleaning and dust laying.

Disposal of street cleanings.—The disposal of the street refuse removed by street cleaning is to be differentiated as fully as practicable from that of the work of street cleaning proper. The line of demarcation is substantially that described for the differentiation of the disposal of household refuse from the collection of refuse as stated on page 37. If street cleanings are hauled away by the pick-up teams and dumped upon land, the services of the teams and teamsters should be included as part of the work of street cleaning, and the only expense for disposal will be that of the services of men at the dumps for leveling off the land, etc. In case the street cleanings after being hauled to a dump are transported by rail or boat to a place of final disposal, the cost of disposal should include the expenses above mentioned, together with the costs of transportation and all expenses incidental to such transportation to the place of final disposal.

---

[1] Harrington's Practical Hygiene.

[2] January 6, 1911.

Methods of street cleaning.—In the cleaning of streets and alleys American cities make use of the following different methods or processes: (1) Hand sweeping, (2) horse or motor sweeping, (3) flushing or washing, and (4) gutter cleaning. Under (1) are included all sweeping or cleaning of streets with hand brooms, small pick-up machines, and other apparatus operated by human labor. Under (2) is included all cleaning by horse or motor-driven apparatus for sweeping the streets, whether combined with pick-up devices or not. Under (3) is included all cleaning of streets by the use of water, by machine flushing, by hose flushing, or by washing with what are called "squeegees" or other devices. Under (4) is included the cleaning of gutters of unpaved streets when such cleaning is not associated with any sweeping, scraping, or other cleaning of the general street surface.

The work of gathering up street cleanings from the gutters after the processes mentioned in (1), (2), and (3) is in reality a part of the work of cleaning streets by those methods and should be so treated in the accounts and records. If, however, any city desires to keep separate accounts and make separate reports of the cost of this pick-up service, it should differentiate it so as to show the amount and cost of such service for each class of street cleaning, and also the quantity of cleanings removed.

Snow and ice removal.—The purpose of snow and ice removal is somewhat different from that of street cleaning. Snow and ice are removed to make streets passable for pedestrians and to facilitate traffic, and hence the work of removing them is a part of the highway service and not of the service for promotion of cleanliness. That work is, however, usually under the supervision of the street-cleaning department and is performed in large part by street-cleaning employees. This is especially the case where a street-cleaning service is maintained throughout the year. Under these circumstances it has been impossible in all cases to secure statistics of snow and ice removal, all costs of the service being included with that for street cleaning in the accounts of many cities.

ACCOUNTS, RECORDS, AND REPORTS OF STREET-CLEANING SERVICE.

Uniform accounts and reports of street-cleaning service.—The general requisites for a successful scheme of uniform accounts and reports for all departments of governmental service are set forth in the introduction to this report. On pages 14 and 15 definitions are presented of such standard terms as expenses and outlays, and a scheme of accounts is given in which each account is assigned a descriptive name and a number which shows its relations to all the other accounts and to the system as a whole. The text of Part V of this report, dealing with highways, presents on page 63 a brief list of summary and general accounts for the general highway service arranged in harmony with the scheme of accounts just referred to, and includes a division of accounts specifically arranged for the street-cleaning service. The scheme of accounts is thus arranged because the street-cleaning service is under a common administration with the highway service in 137 of the 158 cities covered by this report. In this connection it should be noted, however, that if the street-cleaning service is under the supervision of some division of the municipal administration other than the highway department, the accounts relating to it should be adjusted to the other accounts of the department substantially as they are arranged with reference to the other accounts of the highway department in the following exhibit of accounts for the street-cleaning service, and the more complete scheme of accounts of which the same is a part, given on page 63.

3. Cleaning streets:
    30. Administration.
    31. Hand sweeping.
    32. Machine sweeping by horse and motor.
    33. Flushing and washing.
    34. Cleaning gutters.
    35-37. Other cleaning of streets.
    38. Disposal of street cleanings.
    39. Snow and ice removal and disposal.

No specific use is assigned to accounts numbered 35 to 37. Those accounts may be used for recording the costs of any class of street-cleaning work not specifically provided for by the numbered accounts.

In addition to keeping the accounts numbered 30 to 39, as above outlined, cities should keep a sufficient number of three-digit or subgeneral accounts to show for each of the accounts 31, 32, and 33 the costs of cleaning by different methods each class of streets; that is, one subgeneral account subordinate to account 31 should record the cost of hand sweeping asphalt-paved streets, another the cost of hand sweeping brick-paved streets, and other accounts the cost of cleaning other classes of streets, either regularly or occasionally by hand or by other methods.

Physical or general records.—The physical or general street-cleaning records of cities should follow the same classifications as are employed in the financial records. They should show for each kind of street and alley, classified according to the character of surface, (1) the length in miles and area in square yards subject to regular cleaning; (2) the length in miles and area in square yards that were cleaned one or more times during the year but not subject to regular cleaning every week; (3) the length in miles for which the only cleaning was that of the gutters; (4) the quantity of cleanings collected; (5) quantity of snow and ice removed, stated in tons or cubic yards; (6) area (square rods) of territory from which the snow was removed; and (7) the number of snowfalls for which the service was performed. The area and length of streets thus recorded for street cleaning should be entered under titles "streets regularly cleaned," "streets occasionally cleaned," "streets with gutters only cleaned," and "quantity of cleanings collected" or "snow removed" in tons or cubic yards.

With records thus kept it will be easy to report at the close of every fiscal period the aggregate of surface cleaned by each method and the quantity of cleanings for each class of streets, and quantity of snow removed as above set forth, and given under the designation "area of cleaning done," or "square yards of cleaning," and "tons" or "cubic yards of cleanings," and "tons" or "cubic yards of snow removed," etc.

In addition to the foregoing general or physical records which are needed to correlate with the financial accounts in order to show the costs of such service per unit of area of street surface cleaned or freed from snow and per unit of cleanings or snow collected, other records are required to give all the data necessary for a complete understanding of the service. These are detailed records of the equipment, including horses, machines, and other apparatus, the average distance the refuse or snow is hauled, and the number of employees of the various classes in the service. Moreover, the general and physical records, as well as those for expenses, should take account of the character of the pavements cleaned or freed from snow; for without knowledge of this kind it is impossible to determine the efficiency or economy of the service in different cities or in different parts of the same city. This may be seen from the fact that New York City in 1907 by experiments demonstrated that granite-block pavement was 40 per cent and cobblestone pavement 20 per cent more expensive to clean than sheet asphalt.

Another factor of almost equal importance to be considered in connection with street cleaning and, to a lesser extent, with snow removal, is the state of repair of the pavement to be cleaned. The experiments in New York City in 1907 also demonstrated that it cost 20 per cent more to clean a pavement in fair condition and 40 per cent more to clean one in poor condition, than to clean one in a good state of repair. The records of street cleaning properly kept take on under these circumstances an additional importance from their relation to the general highway service. The figures quoted show that the costs of street cleaning must be taken into account in considering the frequency with which streets should be repaired and resurfaced; for without statistics from the street-cleaning service as to the cost of cleaning streets in different states of repair, the persons in charge of the general highway service lack important data for the proper guidance of their labors.

Another class of data with reference to street cleaning which should be provided by the general or physical records of cities is that which shows the proportion of the area cleaned in the business section of the city to that in the residence section. The former area is always more expensive to clean than the latter, and without taking this fact into consideration no just comparison of street-cleaning expenses can be made between different cities. Information is also desirable as to the area in square yards of streets cleaned per day or per week by more than one method, and thus the extent of the area so cleaned that is contained in the total. To aid in interpreting records and statements of costs per unit of work or of service, city records should set forth the kind or type of machine used in cleaning each kind of pavement, the method of using each class of machine, the number of miles of street car tracks on streets, and should state whether the street cleaning requires preliminary sprinkling. Accurate records should also be kept of the number of men and of horses employed in street cleaning and snow and ice removal, and the aggregate number of days' service by each.

Records of contract street cleaning.—Measures should be taken to secure and publish statistics of street cleaning and snow and ice removal by contract such as are here outlined for the services when performed by city employees. In this manner the information would be secured for ascertaining the relative economy of street cleaning and snow and ice removal by city employees and by contractors.

STATISTICS OF STREET-CLEANING SERVICE.

Contents of general tables.—Table 13 presents a general summary of the street-cleaning service in the 158 cities covered by this report, and Tables 14, 15, and 16 present a number of additional details of the service.

Imperfections of statistics.—These tables are far from containing all of the details requisite for a comprehensive study of the street-cleaning service in the various cities. They show, however, the area subject to cleaning, the average number of employees engaged, the quantity of sweepings removed, and the cost of cleaning. Much of the data on the area regularly and occasionally cleaned is inaccurate. Probably in no other department of municipal administration are physical records so imperfect as in that of street cleaning. Comparatively few cities have accurate records of the area subject to the different methods of cleaning, the hours or days of service devoted to the areas cleaned by the different methods, or the quantity of street sweepings and snow and ice removed, and even fewer have ever made computations to determine the cost of cleaning per unit of service rendered, such as the cost of cleaning per square yard or per million yards of surface. Moreover, it was impossible in many cases for census agents to obtain correct information on the number of times streets were actually cleaned during the year. Apparently there was no regular schedule in many cities, and the frequency of cleaning depended upon a variety of circumstances. This was especially the case with respect to cleaning by flushing, the frequency of which depended to a large extent upon weather conditions.

Highway areas cleaned.—In each of the 158 cities covered by Table 13 there was a certain area that was subject to a regular schedule of cleaning, and in the great majority of cities a part of the highway area was cleaned at least once a week. In general, the only streets and alleys thus regularly cleaned were those whose surface was paved with hard materials, such as granite, Belgian blocks, brick, asphalt, or tar-bound macadam. In a limited number of cities, however, streets with oil or water-bound macadam or similar pavements were also reported as being regularly cleaned. The relation of the area of streets and alleys with paved surfaces to the total area of such streets regularly cleaned is shown in the first two columns of Table 13, and the percentage of the total paved surface subject to regular cleaning in the third column.

The table, in addition to giving the total area of streets and alleys regularly cleaned, gives the area cleaned by each of the methods or combination of methods employed. It also gives the total mileage subject to occasional but irregular cleaning.

Areas regularly cleaned.—Included in the areas swept by hand are areas cleaned by street sweepers, whether operating hand-cleaning machines or broom and shovel. In many cities areas subject to hand cleaning by day were by night swept by machines drawn by horses, or other power, or flushed, and in a few cases they were swept and also occasionally flushed.

In the table which follows is shown the area in square yards of highways subject to regular cleaning by each of the methods employed, as reported by the Bureau of the Census in 1909 and 1907. A considerable area was cleaned by more than one method, as by sweeping by both hand and machine and by both sweeping and flushing. When this is the case the total area is shown for each of the methods employed, thus giving rise to some duplication in figures. The extent of the duplication in 1909 was 46,150,305 square yards, or 26.8 per cent of the total area subject to regular cleaning. Similar duplications were included in the 1907 report, but the amount thereof was not ascertained.

YEAR.	SQUARE YARDS OF HIGHWAYS REGULARLY CLEANED.		
	Swept by hand.	Swept by machine.	Flushed.
1909	98,952,772	86,256,598	33,372,653
1907	96,608,689	77,841,572	32,899,840
Increase	2,344,083	8,415,026	472,813

Changes in the character of service.—The above exhibit indicates that there was a considerable increase in the total highway area subject to regular cleaning during the intervening years; that practically three-fourths of the increase was in the area swept by machine; and that the increase in the area cleaned by flushing was very small.

Percentage of area swept.—Of the total areas of highways subject to regular cleaning, 90.5 per cent was swept either by hand or machine, or both by hand and machine, or was cleaned both by sweeping and flushing; and the remainder, or 9.5 per cent, was cleaned by flushing or washing only. Of the total area subject to regular cleaning, 9.9 per cent was swept and also flushed or washed. Stating the area flushed on the same basis as that of the area swept, we find that 90.5 per cent of the area subject to regular cleaning was regularly swept, and 19.4 per cent was regularly flushed or washed.

Areas occasionally cleaned.—A comparison of highway areas occasionally cleaned in the various cities as given in Table 13 is of little significance or value. This fact becomes apparent when consideration is taken of the widely varying frequency of such cleaning in the different cities, and the fact that all highways cleaned less than once a week for 40 weeks during the year were tabulated as occasionally cleaned, although such arbitrary classification can show no distinction between those cleaned 39 times during the year and those cleaned on what are called monthly cleaning days or only at the spring and fall general cleanings. No very great progress can be made in compiling street-cleaning statistics until this infrequent and irregular cleaning is differentiated from the more thorough occasional sweeping of cities such as those referred to above in the same manner as the occasional cleaning is distinguished in the tables from the regular cleaning of streets one or more times per week.

For the proper understanding of the tables, attention should be called to another class of street cleaning which is included in Table 13 in statistics of mileage of highways occasionally cleaned. It is the mileage of improved streets and oil and water-bound macadam or gravel streets that are occasionally raked for leaves, paper, and other rubbish that accumulate on highways. This raking is a class of street cleaning, but it is so distinct from the other class of street cleaning that its statistics should be given separately; and until the records are so kept that this is possible, certain figures of the street-cleaning service will continue as they are at present—of little value for purposes of comparison. In the scheme of uniform accounts outlined by the Bureau of the Census for the street-cleaning service, special provision has been made for recording the class of street cleaning last mentioned, and also the amount of service performed in all occasional as well as regular cleaning of streets.

Frequency of street cleaning.—Table 14 presents for the 158 cities covered by the report statistics of the areas of streets subject to the regular cleaning classified according to the reported frequency of cleaning, and also the method of cleaning, as by hand sweeping, machine sweeping, and flushing. The areas cleaned each week by each of these three methods as given in Table 13 were computed from the data presented in Table 14. Many of the figures given in Table 14 are estimates, indicated by being printed in italics. These estimates are (some of them, at least) based upon more or less imperfect data, and thus give rise to inaccuracies, not only in Table 14, but also in Table 13.

Average number of employees in street cleaning.—Table 15 presents statistics of the average number of employees in the street-cleaning service, classified by the occupation or class of work in which they are engaged, and also by the subdivision of the street-cleaning service in which employed, as that of hand sweeping, machine sweeping, flushing, hauling, and all other.

Statistics of snow and ice removal.—Such data as were obtained relative to snow and ice removal for cities in the North and South Atlantic and North Central divisions of states in the present investigation of the sanitary and highway services are shown in Table 16. The states within these divisions are arranged according to geographic location and the cities within each state according to size.

The costs of this service could not always be segregated from the other expenses for street cleaning, and data relating to number of employees and days work were even more incomplete than the financial data. The number of days work reported for some cities was the number of days service by extra employees in times of severe storms; while for others the number of days work reported was that by the men engaged in shoveling snow. The result is that for several cities the reported cost of the service does not correspond with the number of days work reported. Palpable instances of such inconsistencies have been footnoted.

PART IV.—DUST-PREVENTION SERVICE.

CHARACTER AND IMPORTANCE OF SERVICE.

Relation of service to public cleanliness and public health.—The term *dust-prevention service* is applied, in this report, to that branch or subdivision of municipal activities which is organized and conducted for the prevention of street dust. The relation of street dust to public cleanliness and public health has been set forth on page 57 in the text discussion of the street-cleaning service. From the facts there presented it becomes evident that the municipal service of dust prevention is closely related to the municipal functional activity of sanitation or the promotion of cleanliness, the same as are the sewer, refuse-disposal, and street-cleaning services.

Relation of service to the general highway service.—But notwithstanding this relation of the dust-prevention service to the three services last mentioned, that service is treated by the Bureau of the Census as a subdivision of the highway service by reason of its more intimate relation to such service. It bears this relation since all the methods that have been adopted for lessening or eliminating street dust aid in the preservation of the surface of macadamized, gravel, and dirt streets. On such streets the use of dust preventives assists in binding together the particles of stone and dust on the surface of the street and thus improves the character of the highway surface, increases its length of life in use, and lessens other costs for its care and maintenance. The sprinkling of streets with water, which was the first dust preventive employed, had this effect in no small degree, and the use of calcium chloride, oil, and various bituminous compounds has shown that these substances are even more efficient as agents for the improvement of the street surface and the lessening of other costs of caring for and maintaining macadamized, gravel, and dirt streets.

ACCOUNTS, RECORDS, AND REPORTS.

Essentials for good accounts and reports.—The financial and physical or general records and reports of the dust-prevention service should set forth separately the facts relating to each and every class of treatment, as those for water sprinkling, oil sprinkling, treatment with calcium chloride, asphaltum compounds, etc. For each method of treatment the financial accounts should give exact statements of expenses, including those for repairs and replacement of equipment. In like manner the general records should show for each method of treatment the area subject to treatment, the number of times treated during the year, and quantity of dust preventive used.

To secure a complete statistical statement of the service and thus to furnish all the data for measuring efficiency and economy, the general records must contain in addition to that which has just been stated a record of the equipment used, the number of workmen employed in each capacity, the results of the work done as the same affects the maintenance of the highways, the state of efficiency of the highway service, the effect of the dust-preventive treatment upon the wearing qualities of the highway surface, and all kindred information. As few, if any, cities keep such records it is impossible at the present time to present statistics of the dust-prevention service having as high a degree of exactness as is desirable.

Units of service.—Various units of service in the dust-prevention service are employed by the different cities. Among those most frequently employed are treatment of a square yard of surface or of 1 foot of street length; one cart-day worked; or 1,000 gallons of water, oil, or bituminous liquid, or 1,000 pounds of calcium chloride used; or one sprinkling cart or wagon worked one year. Each of these units is of value in determining some facts relative to the economy and efficiency of the service; but in consequence of difference in equipment or in conditions surrounding the service some of these units are less valuable than others, and only those are applicable in a given city which relate to the method of dust prevention employed by that city. Of the units mentioned the one most satisfactory is probably a single treatment, by sprinkling or otherwise, of a square yard.

Uniform accounts for service.—The general requirements for a successful scheme of uniform accounts for all departments of governmental service have been set forth in the Introduction to this report, and in the same part of this report has been described at length the value of such accounts for comparisons of the economy and efficiency with which the service is administered in the several cities. In the same part of this report have been presented definitions of such standard terms as expenses and outlays, and there also has been presented a scheme of accounts adapted to all departments of municipal service, in which each account is given a descriptive name and a number which shows its relation to all the other accounts and to the system as a whole. In the same part attention has been called to the fact that in only 23 of the 158 cities covered by this report is the administration of the dust-prevention service separated from that of the general highway service or some other department or branch of the service. This general tendency of cities to combine the two services under one administrative head demonstrates that, from an administrative point of view, a workable scheme of uniform accounts for the dust-prevention service must be such that it can readily be made a part of the scheme of such accounts for the general highway service. With this in mind the scheme which follows is shown on page 63 as an integral part of a more complete scheme for highway accounts. In this connection it should be noted, however, that if the dust-prevention service is under the supervision of some division of the municipal administration other than the highway department the accounts relating to it should be adjusted to the other accounts of such department substantially as they are arranged with reference to other accounts of the highway department in the following exhibit, and in the more complete scheme of accounts of which the same is a part, given on page 63. If the dust-prevention service is administered as an independent branch of the city government, the accounts should be organized substantially as outlined in the scheme which follows for this particular branch of service:

4. Prevention of street dust—
    40. Administration.
    41. Sprinkling with water.
    42–49. Sprinkling and treating with oil and other substances, each to be reported separately, and accounts therefor given special numbers and separate names descriptive of the methods.

STATISTICS OF DUST-PREVENTION SERVICE.

Street sprinkling with water.—In Table 17 are shown statistics of the dust-prevention service in those cities in which streets were regularly sprinkled with water at the expense of the city during 1909, exclusive of the sprinkling that was for the purpose of laying dust preliminary to street sweeping.

Of the 158 cities covered by this investigation, the streets were sprinkled regularly at the expense of the city in 99 cities. In 56 of these it was by horse-drawn sprinkling carts; in 12, by street-car sprinklers; and in 31, by both horse-drawn sprinkling carts and street-car sprinklers. Of the 87 cities in which sprinkling was done by carts, the sprinkling was done by city employees only in 59 cities, by contractors only in 15 cities, and by both city employees and contractors in 13 cities.

The number of employees reported for nearly all cities is exclusive of superintendents and foremen, who are reported for the larger department—usually the street department—under which the street-sprinkling service was administered. In cities where all sprinkling reported was by contract, the city employees reported were inspectors of the contract work.

Length and area of streets regularly sprinkled.—Both the length in miles and area in square yards of streets subject to regular sprinkling are shown in Table 17. The figures as to length, even though in many cases estimates, are more nearly accurate than those relating to area. In fact, the latter figures were often obtained by simply multiplying the length sprinkled by an estimated average width of streets. The area thus obtained does not always represent even approximately the actual area sprinkled, since in many cases the application was limited to a portion of the width of the street.

The figures for area regularly sprinkled, per employee or per cart, can not be used for measuring the efficiency of the service, owing to the wide variations in the frequency of sprinkling in the different cities.

Sprinkling by car sprinklers.—Sprinkling by street-car sprinklers was reported by 43 cities. In some cities the sprinkling by car sprinklers was confined to the area between the car tracks, or to this area and a narrow space outside of the rails. This was the case where the sprinkling was obligatory under the terms of the franchise. In some of these the sprinkling was at the expense of the city, while in others it was entirely or partly at the expense of the street-car companies, depending upon the terms of the car company's franchise. In the following cities the entire expense of the sprinkling was apparently borne by the street car companies: Cleveland, Ohio; Pittsburgh, Pa.; Newark and Jersey City, N. J.; Louisville, Ky.; Paterson, N. J.; Wilmington, Del.; Youngstown, Ohio; Springfield, Ill.; Little Rock, Ark.; Atlantic City, N. J.; and Chester, Pa. In Seattle, Wash., and Providence, R. I., the sprinkling was at the expense of the city; in Portland, Oreg., the city paid the street-car company $1.15 per hour for each car and crew; in Memphis, Tenn., the car sprinklers were owned by the car company but operated by the city; in Grand Rapids, Mich., the city paid the car company $0.12 per mile for sprinkling; in Lowell, Mass., the city paid $4.75 per month for each car operated, and a further sum of $3 per car per day or portion of a day operated; in Waterbury, Conn., the city paid the wages of the motorman and a laborer on each car; in Sacramento, Cal., the city paid the street railway company a stated amount per month for street-car sprinkling; in Davenport, Iowa, the city owned the car sprinkler; and in Taunton, Mass., the city paid the cost estimated at a certain rate per linear foot on both sides of the street. For other cities no report was secured as to whether the city or the street-car company bore the expense of sprinkling by car sprinklers.

Quantity of water used in sprinkling.—Several cities kept a more or less accurate record of the quantity of water used in street sprinkling, and where such records were kept or an estimate could be obtained of the quantity used, the amounts are shown in Table 17. Although unintentional, the quantity reported for some cities probably includes that used preliminary to sweeping, no segregation having been made.

Cost of sprinkling.—Under the cost of sprinkling are given the total payments for the sprinkling done, and also the cost per 1,000 population. For a few cities the cost of the sprinkling preliminary to sweeping may be included in the cost reported; but for most cities payments for such sprinkling are included with those for street cleaning.

Frequency of sprinkling with water.—The frequency with which streets are sprinkled with water varies greatly in different cities and in most cities in different sections of the city. The cities which had in 1909 the same frequency of sprinkling in residence and business portions are the following:

- Two to eight times daily:
  - Milwaukee, Wis.
  - St. Paul, Minn.
  - Nashville, Tenn.
  - Brockton, Mass.
- Four times daily:
  - Washington, D. C.
  - Lawrence, Mass.
  - Evansville, Ind.
- Three times daily:
  - Atlantic City, N. J.
  - Haverhill, Mass.
  - Fitchburg, Mass.
- One to four times daily:
  - Boston, Mass.
  - Memphis, Tenn.
  - Bay City, Mich.
- One to three times daily:
  - New York, N. Y.
  - San Antonio, Tex.
- Twice daily:
  - Indianapolis, Ind.
  - Denver, Colo.
  - Columbus, Ohio.
  - Fall River, Mass.
  - Cambridge, Mass.
  - Hartford, Conn.
  - Salt Lake City, Utah.
  - Wilmington, Del.
  - Somerville, Mass.
- Twice daily—Continued.
  - Waterbury, Conn.
  - Schenectady, N. Y.
  - Malden, Mass.
  - Dubuque, Iowa.
  - Everett, Mass.
  - La Crosse, Wis.
- Daily:
  - New Orleans, La.
  - Springfield, Mass.
  - Troy, N. Y.
  - Yonkers, N. Y.
  - Savannah, Ga.
  - Butte, Mont.
- Four to eight times weekly:
  - Oakland, Cal.
  - Johnstown, Pa.
- Two to six times weekly:
  - Seattle, Wash.
- One to three times weekly:
  - Los Angeles, Cal.
- Twice weekly:
  - Worcester, Mass.
  - Paterson, N. J.
  - East St. Louis, Ill.
  - Salem, Mass.
  - Kalamazoo, Mich.
- Once weekly:
  - Newark, N. J.
  - Jersey City, N. J.

In the following cities the frequency of sprinkling varied between the business and residence sections as follows:

- Business, four times daily; residence, twice daily:
  - Grand Rapids, Mich.
  - Houston, Tex.
  - Holyoke, Mass.
  - Pueblo, Colo.
- Business, three or four times daily; residence, once or twice daily:
  - San Francisco, Cal.
  - Dallas, Tex.
  - Birmingham, Ala.
- Business, three times daily; residence, two or three times daily:
  - Springfield, Ill.
  - Chelsea, Mass.
- Business, twice daily; residence, once daily:
  - Davenport, Iowa.
  - Augusta, Ga.

In Minneapolis, Minn., streets were sprinkled from four to eight times daily in the business section, and from two to eight times daily in the residence sections; in Lowell, Mass., from three to five times daily in the business section, and twice daily in the residence sections; in Trenton, N. J., five days per week in the business section, but no sprinkling was done by the city in the residence sections; in Elizabeth, N. J., there was no sprinkling in the business section, and but once a day in the residence sections; in Norfolk, Va., streets were sprinkled six times daily in the business section and three or four times daily in the residence sections; in Oklahoma City, Okla., five times daily in the business section, but no sprinkling was done in the residence sections; in Sioux City, Iowa, once or twice daily in the business section, and three times a week in the residence sections.

Portions of street sprinkled.—In most American cities which sprinkle streets with water, the watering covers the entire width of the street or roadway; and if any part of that width is unsprinkled, it is usually that which lies nearest the gutters or curbs. This practice differs somewhat from that reported for London, England, by Consul General John L. Griffiths in the Daily Consular and Trade Reports for March 12, 1913, in which in referring to the city mentioned he says:

> In the city proper and in the immediately adjoining boroughs the streets are sprinkled in dry weather. In the suburban districts this watering usually covers the entire width of the road, if of macadam, or stone blocks; but if of asphalt or wood, it is confined to two or three feet near the curb, to avoid rendering the surface slippery and dangerous to traffic. In very hot weather disinfectants are mixed with the water.

Special assessments for street sprinkling with water.—In 35 of the 99 cities in which street sprinkling was carried on as a municipal function, a part or all of the cost of the sprinkling was assessed against the property abutting on the streets sprinkled. The following is a list of these cities:

St. Louis, Mo.
Minneapolis, Minn.
Rochester, N. Y.
St. Paul, Minn.
Columbus, Ohio.
Worcester, Mass.
Syracuse, N. Y.
Lowell, Mass.
Cambridge, Mass.
Dayton, Ohio.
Bridgeport, Conn.
Hartford, Conn.
Lynn, Mass.
Springfield, Mass.
Lawrence, Mass.
Duluth, Minn.
Somerville, Mass.
Waterbury, Conn.
Evansville, Ind.
Akron, Ohio.
Portland, Me.
Brockton, Mass.
Malden, Mass.
Haverhill, Mass.
Salem, Mass.
New Britain, Conn.
Augusta, Ga.
Butte, Mont.
Fitchburg, Mass.
Racine, Wis.
Auburn, N. Y.
Taunton, Mass.
Everett, Mass.
Oshkosh, Wis.
Chelsea, Mass.

The assessments were generally levied upon the front-foot basis, and for most cities were apparently uniform throughout the city. Thus the rate was reported as 2 cents per front foot for Fitchburg and Everett, Mass.; 3 cents per front foot for Salem, Mass., and New Britain, Conn.; and 5 cents per front foot for Lynn, Mass., Duluth, Minn., and Somerville, Mass. In many cities the rate varied with the width of the street sprinkled and the number of times sprinkled per day. In Minneapolis, Minn., the rate was uniform for each ward; in St. Paul, Minn., the total cost of sprinkling for the year was assessed against the property owners on a front-foot basis, according to the number of applications of water during the entire season.

Water sprinkling by private associations.—In many cities the street sprinkling was done by private associations of householders who had clubbed together for the purpose. These associations have not, as a rule, any accurate records of the amount of money raised for the sprinkling, nor of the length or area of streets subject to sprinkling. It was deemed inadvisable, therefore, to attempt to get detailed information with respect to this sprinkling, except such information relative to length in miles of street sprinkled as could be supplied by city authorities.

In the following list are shown the cities in which more or less sprinkling was done by private associations of householders, together with the number of miles sprinkled where such was reported:

City number.	CITY.	Miles sprinkled.	City number.	CITY.	Miles sprinkled.
2	Chicago, Ill		86	Peoria, Ill	
4	St. Louis, Mo	2.00	88	Fort Wayne, Ind	
6	Baltimore, Md		91	Terre Haute, Ind	10.00
7	Cleveland, Ohio	75.00	92	East St. Louis, Ill	1.00
9	Detroit, Mich		98	Bayonne, N. J	
10	Buffalo, N. Y	15.06	99	Covington, Ky	4.00
11	San Francisco, Cal	1.50	100	South Bend, Ind	2.05
12	Cincinnati, Ohio	352.00	102	Altoona, Pa	15.71
14	Newark, N. J	48.00	103	Mobile, Ala	
15	New Orleans, La	10.00	104	Allentown, Pa	
18	Los Angeles, Cal	1.00	105	Pawtucket, R. I	0.70
19	Jersey City, N. J		106	Saginaw, Mich	2.00
20	Kansas City, Mo	25.00	108	Wichita, Kans	14.00
22	Louisville, Ky	10.00	110	Binghamton, N. Y	
23	Seattle, Wash	5.10	111	Lancaster, Pa	
24	Providence, R. I	15.00	113	Little Rock, Ark	11.00
25	Rochester, N. Y	1.00	114	Springfield, Ohio	16.00
32	Atlanta, Ga	12.00	117	Rockford, Ill	
33	Syracuse, N. Y		118	York, Pa	
36	Paterson, N. J	28.00	119	Lincoln, Nebr	4.00
37	Omaha, Nebr		120	Chattanooga, Tenn	
42	Grand Rapids, Mich	1.44	129	McKeesport, Pa	3.50
51	Reading, Pa		130	Wheeling, W. Va	3.00
59	Wilmington, Del		136	Chester, Pa	
61	Des Moines, Iowa	4.50	137	Kalamazoo, Mich	9.00
63	St. Joseph, Mo	5.50	140	Galveston, Tex	2.70
64	Troy, N. Y		143	Elmira, N. Y	13.00
66	Tacoma, Wash	7.20	144	Quincy, Ill	5.25
71	Kansas City, Kans	2.55	147	Macon, Ga	2.00
73	Waterbury, Conn		150	Joliet, Ill	
75	Schenectady, N. Y	2.60	151	Taunton, Mass	48.00
76	Hoboken, N. J	7.00	155	Joplin, Mo	2.75
83	Wilkes-Barre, Pa	3.50	157	Newport, Ky	5.00
84	Erie, Pa		158	South Omaha, Nebr	1.00

Dust preventives other than water.—The great cost of dust prevention on highways by means of frequent application of water has led many cities within the last few years to experiment with the application of substances other than water for the prevention of dust. As early as 1900 San Francisco sprinkled certain of its drives or city highways with oil. In succeeding years other cities experimented with oils and emulsions of oil, generally first on park drives, and then on the boulevards and other highways of the city. By 1909 the use of oil as a dust preventive was beyond the experimental stage, and in some cities had largely superseded the use of water.

The cities in which oil or some dust preventive other than water was used in 1909, and the kinds of dust preventive used, are shown in Table 18. Of the 158 cities covered by the investigation, 48 appear in this table. The kinds of preventive used are given in many cases under their patented or trade names. The use of calcium chloride was reported by Boston and Springfield, Mass., only, but since 1909 this substance has been used by several other cities.

It is to be noted that in several cities the use of oil was confined to park drives and boulevards, though the area of these highways treated formed only about one-fifth of the total area treated.

PART V.—HIGHWAYS AND GENERAL HIGHWAY SERVICE.

DEFINITIONS, ACCOUNTS, RECORDS, AND REPORTS.

Definitions.—The term *highway* is used by the Bureau of the Census as the generic designation of streets, roads, alleys, walks, and other thoroughfares open to the public travel, and the structures therein or thereupon forming a part of the same. In this report, however, are presented statistics relating only to those highways and highway structures which are outside of park areas, including statistics of the so-called boulevards and drives of cities outside of parks, whether under highway or park management.

Work upon highways or in connection with their care, maintenance, and lighting is here referred to as the *highway service*. That service in this report is separated into three branches, each given a distinct name—as, the *general highway service;* the *street-cleaning service;* and the *dust-prevention service*. Statistics for the latter branches of the highway service have been presented in Parts III and IV. In this part are presented statistics of highways and of that portion of the highway service which is here referred to as the *general highway service*, or service upon the highways other than street cleaning and dust prevention.

Requirements for uniform accounts and reports.—The ends to be attained by the adoption of a scheme of uniform accounts and reports for each department of governmental service are set forth on page 14 of the text of the Introduction to this report. In the same connection are given definitions of such standard terms of accounting as those of expenses and outlays, and a description of a scheme of accounts of different orders in which all accounts are given descriptive names and numbers showing the relation of each account to all the others and to the system as a whole. The description there given will apply with slight modifications to the system of accounts here presented for the highway service, which includes, as has been previously stated, the street-cleaning and dust-prevention services, as well as the general highway service.

Accounts for expenses:

0. General highway administration—

00–09. As needed.

1. General maintenance of roadways or streets, roads, and alleys—

10. Roads, etc., without paved surface.

11–18. Streets, etc., with specified kinds of paved surface, such as water-bound macadam, oil-bound macadam, sheet asphalt, brick, etc.; the expenses for each class of pavement to be recorded separately, and the account therefor given a descriptive name and a separate number.

Accounts for expenses—Continued.

1. General maintenance of roadways or streets, roads, and alleys—Continued.

19. Compensated work by highway departments, or work by highway departments in repairing cuts made in pavements by other departments or by private parties, and other work by the highway force for other departments and the public for compensation, exclusive of work the costs of which are met from special assessments or charges in the nature of special assessments. All amounts summed up in account 19 should be classified according to character of work, and recorded in separate three-digit accounts, the first two digits of the numbers of such subordinate accounts being 19.

2. Maintenance and care of highway structures—

20. Maintenance and care of sidewalks.

21–29. Maintenance and care of specified classes of structures, such as crosswalks, curbs, gutters, bridges for abolition of grade crossings, watering troughs, drinking fountains, street signs, etc.; the expenses for each to be separately recorded, and accounts therefor given separate numbers and descriptive names.

3. Cleaning streets—

30. Administration.

31. Hand sweeping.

32. Machine sweeping by horse and motor.

33. Flushing and washing.

34. Cleaning gutters.

35–37. Other cleaning of streets.

38. Disposal of street cleanings.

39. Snow and ice removal and disposal.

(For further details, see Part III.)

4. Prevention of street dust—

40. Administration.

41. Sprinkling with water.

42–49. Sprinkling and treating with oil and other substances; the expenses for each to be recorded separately, and accounts therefor given separate numbers and names descriptive of the methods.

(For specific instructions, see Part IV.)

5. Street lighting—

50–59. Cost of each class of lighting to be recorded in separate accounts with numbers and descriptive titles.

6 and 7. Together with subordinate general and subgeneral accounts as needed. These accounts are to be used for distribution or incidental operating accounts, or for recording the expenses of other functional activities of the department in charge of highways. All such accounts should be grouped under significant and descriptive titles and given appropriate numbers.

Accounts for outlays:

8. All outlays—

80. Land, buildings, etc., for administration.

81. Land for highways and cost of opening, widening, and grading streets.

Accounts for outlays—Continued.
  8. All outlays—Continued.
    82. Street pavements or costs of hard surface.
      820–829. Cost of each kind of paving, such as macadam, sheet asphalt, etc., to be recorded separately and the account therefor assigned a separate descriptive name and three-digit number.
    83. Street structures other than pavements.
      830–839. Cost of specified structures such as those for sidewalks, curbs, gutters, bridges for abolition of grade crossings, watering troughs, drinking fountains, street signs, etc.; to be recorded in separate accounts with descriptive titles and with three-digit numbers.
    84. Equipment of department.
      840. Equipment for administration.
      841–849. Equipment of various branches of highway service; to be recorded after descriptive titles and with proper account numbers.
Accounts for revenues and appropriations:
  9. Revenues and appropriations—
    90–99. As needed.

Distribution or incidental operating accounts.—As a result of the different organizations of highway departments and the varying methods of control of the same, numerous variations must exist in accounts of different cities with their highway services, particularly in their accounts with the management of stables and other subordinate branches of work. All expenses of these auxiliary branches of service should first be charged to a distribution or incidental operating account and later distributed to the several appropriation accounts; in the report they should be classified as set forth after the distribution. These distribution accounts, whether arranged on the basis here set forth or on a different basis may be given numbers not otherwise used, or may be given letters in connection with numbers, as may be found most convenient.

Physical and general records.—The physical and general records that should be kept by those in charge of the highway department are numerous. Attention is first called to those relating to highway improvements and highway structures. The records relating to streets should show the length in miles of each kind of paved street, and of those without such hard artificial surface. In addition the records of streets with hard-paved surface should show (1) the total width of the street from curb to curb, (2) the width of the pavement proper, (3) the square yards of the street surface from curb to curb, and (4) the square yards of the pavement proper. The width and area of the pavement proper as distinguished from that of the street is usually the width and area of that portion of the street which is not covered by gutters constructed of material different from that of the pavement. The records should also show the proportion of the paved surface, if any, which is paid for by street railway companies.

The records of sidewalks, curbs, gutters, and other highway structures should show in similar detail the miles of each class of structures made of each class of material, and in the case of gutters and sidewalks the area in square yards and average width. In addition the annual construction should be recorded the same as the aggregate construction. With such records it will be easy to correlate costs of work in constructing pavements and other road structures, and the costs of the care and maintenance of highways with the improvements acquired and the work performed, and in these and other ways provide statistics that will fairly measure the economy and efficiency of the highway service.

STATISTICS OF HIGHWAYS AND GENERAL HIGHWAY SERVICE.

The statistics on highways included in Tables 19 to 33 are of all highways within city limits, whether maintained by city, county, or state. These highways are divided into *streets* and *alleys*, but the line of demarcation between the two is not always clearly drawn. The term *street* usually signifies a traveled thoroughfare in a city or town, with a sidewalk on one or both sides of it, or with a space for such a sidewalk. The highways that are here tabulated as streets are in most cases those thoroughfares that divide the city into squares or blocks. *Alleys* are the narrow driveways that extend into or through the squares or blocks. They are usually from 8 to 25 feet in width, have no sidewalk, and are primarily for the convenience of householders in the square or block. In some cities, however, especially in those which are not laid out in squares or blocks as above indicated, all thoroughfares are classed as streets.

Statistics of streets and alleys.—In Table 19 and subsequent tables, streets and alleys are grouped according to the character of their surface into three classes, referred to as (1) streets and alleys with durable pavements, (2) streets and alleys with nondurable pavements, and (3) unpaved streets and alleys, or streets and alleys with a surface of the natural soil. The dividing line between the two classes of paved streets and alleys is, however, more or less arbitrary, as may be seen by a list of the different kinds of pavement included in each class, as given in detail in Table 21.

The figures for alleys in Table 19 are much less perfect and comprehensive than those for streets, since the reports secured for some cities omit the length of alleys, while those for others are based upon incomplete and inaccurate local records. As a rule, footnotes to the table call attention to the former class of cities.

The reported length of alleys is an estimate for a large number of cities. For several the estimate was obtained by dividing the number of miles of streets by two. The presence and character of these estimates should be taken into account in all computations and deductions made from the figures of the table that include those for alleys. For a few cities the table presents imperfect statements of the length of unpaved streets, due, as in the other cases mentioned, to the absence of reliable local records. Thus, in many cities, as in St. Paul, Minn., the local records of unpaved streets show the total length of unimproved streets which have been platted or surveyed; while in other cases, as in that of the neighboring city of Minneapolis, the length reported includes traveled streets only.

The proportion of the total length of streets covered with durable pavements is given as 41.2 per cent for the cities of Group I, and successively less for each of the smaller groups. The highest proportion of such streets reported for any city was 82 per cent for Baltimore, Md. The proportion of total street length covered with nondurable pavement was fairly uniform for the totals of the four city groups, though there were great variations in the proportions of such streets between the different cities. Some cities reported no such streets, while several reported more than three-fourths of all their paved streets as of that class. Cities of Group I had the smallest percentage of streets with dirt or unpaved surface, the group totals for Groups II, III, and IV showing successively larger percentages.

Length, area, and width of paved streets.—Table 20 gives for the various cities covered by this report the length in miles, area in square yards, and average width in feet of the streets classified as with durable and nondurable pavements. For an exhibit of the various kinds of street surface included in these general classes of pavements, the reader is referred to Table 21 and the text relating to the same, pages 66 to 70. In addition to the length and area of these two classes of paved streets, Table 20 sets forth the percentage that the length and area of each class formed of the total length and area of paved streets. The area of paved streets includes, as has previously been explained, all the space between the street curbs, and is the area that must be used in statistics of street cleaning and street sprinkling. These areas of paved streets must not be confounded with the area of pavements in streets, which is the area to be used in statistics of constructing, replacing, resurfacing, or repairing pavements. But few cities differentiate in their records between areas of paved streets and area of street pavements, the great majority recording and reporting only the area of the streets. Recognizing this fact, the Bureau of the Census did not attempt to secure reports of the total area of street pavements. It sought to secure the length of all classes of streets and the area of the paved streets, or the total area from curb to curb classified according to the material used in the pavement of the main portion of the highway. In a few cases, however, to some of which attention is specifically called on succeeding pages, the Census agents have probably returned the figure for the area of pavements proper, and not that of paved streets.

With the exception of the cities to which reference has just been made—those in which the only street figures available were those of the pavement area—the average width shown in Table 20 is that of the streets from curb to curb. The average width for the different city groups is fairly uniform, being least for cities of Group I and greatest for those of Group IV. The reason for a less width for the cities of Group I is that that group is composed largely of the older cities of the country in which the streets are narrower than in the newer cities of the Central and Western states, which form a larger proportion of the other groups. The cities of over 100,000 inhabitants reporting the lowest average width of paved streets are Philadelphia and Pittsburgh, Pa., in which the average width reported was 24.9 and 25.5 feet, respectively. In the latter city alleys were included with streets and reduced the average; but in the former the average width given is that of streets alone.

Streets with durable pavements.—The length and area of streets with durable pavements form a much larger percentage of the total for all paved streets in the cities of Group I than in the cities of any other group. The percentage for the cities of Group II is less than that for the cities of Group III. The average width of this class of paved streets shows a greater variation in the group totals than does the average width of all paved streets considered together. The average width of such streets in the cities of Group I was 31.8 feet; for Groups II and III, 33.6 feet; and for Group IV, 36.3 feet. The lowest average width of streets of this character reported for any city was 22.2 feet in Everett, Mass., and the next, 23.1 feet in Taunton, Mass. The highest average width was 63.3 feet reported for Salt Lake City, Utah.

Streets with nondurable pavements.—The average width of streets with nondurable pavement—that is, those with an oil or water-bound surface, usually of macadam or gravel—although comparatively uniform for group totals, shows wide variations between individual cities. It is probable that for some cities the reports gave only the area of that part of the street which had been macadamized; while for the majority of cities the reports were of the entire width of the street from curb to curb, without regard to the portion actually paved. The following cities probably reported only the macadamized portion of the roadways: Topeka, Kans.; Louisville, Ky.; Bay City, Mich.; Wilkes-Barre, Pa.; Bayonne, N. J.; and Toledo, Ohio.

In Table 21 are given the length and area of streets covered with the different kinds of pavement classed as durable, and also of those covered with nondurable pavements.

Durable street pavements, classified by kind of surface.—In the class of durable pavements are included those with an estimated life in use of at least 10 years on streets subject to a moderate volume of light traffic. These pavements comprise those constructed of paving blocks, bricks, or materials bound together by bituminous substances, and include stone-block, brick, wood-block, sheet-asphalt, and bitulithic pavements. Streets paved with oil and water bound macadam, gravel, or shell are grouped with the nondurable pavements. In this connection attention is called to the fact that some streets reported as paved with bitulithic or tar-bound macadam are doubtless covered with ordinary macadam treated with tar or other bituminous compounds, and if their character had been reported would have been tabulated as streets covered with nondurable pavements.

Sheet-asphalt pavements in streets.—This name is applied to pavements composed of a thin surface of asphalt with which has been mixed, while hot, a large proportion of sand or finely pulverized rock, the same resting upon a foundation usually composed of macadam or concrete. It is a comparatively durable pavement when laid on a good foundation, resists the wear and tear of automobile traffic, is easy to keep clean, and gives rise to less noise than brick or stone pavement. Under this classification have been included for Newport, Ky., 0.9 mile of rock-asphalt pavement; for Syracuse, N. Y., 3.6 miles of asphaltina pavement; and for San Francisco, Cal., 3.3 miles of bituminous rock pavement.

Sheet-asphalt pavements were reported by 128 of the 158 cities covered in this investigation, but most of the mileage was reported by cities of Group I.

Bitulithic pavements in streets.—The name "bitulithic" is commonly applied to a pavement the surface of which is composed of a bituminous concrete, the aggregate being a mixture of several sizes of broken stone so proportioned as to give a dense material with a small percentage of voids. Pavements of bituminous concrete have been in use to some extent for a number of years, but the construction of this type of pavement upon any considerable scale began about 1901, when exploited under a patent of the Warren Bros., and most of the pavement of this type since constructed has been under this patent.

In the construction of this pavement a base of crushed stone or slag of varying size, 4 to 6 inches deep, is laid. Upon this base is placed a layer composed of broken stone ranging in size from dust to that just passing a 1½-inch screen, combined while heated to a temperature of not over 250° F. with 10 or 12 per cent of bituminous compound. This layer is spread upon the street to a depth of 2 inches at a temperature of not less than 200° F. and thoroughly rolled with a steam road roller. Upon this layer is placed a sticky quick-drying bituminous cement upon which is spread and rolled into place a layer a half inch thick of small stone chips for a final wearing surface. This coating has the effect of making the pavement much less slippery in wet weather than ordinary asphalt pavement. This paving is smooth, easily cleaned, and practically noiseless. Though not calculated to withstand very heavy traffic, it is well adapted for residential districts and for streets used largely for pleasure and high-speed driving. Under such conditions it ordinarily has a life of at least 10 years.

Tar-bound macadam pavements in streets.—Under modern traffic conditions it has been found that water-bound macadam pavements are soon worn out, especially on those streets subject to a large amount of automobile traffic. The suction of the rubber tires on wheels going at a high rate of speed soon tears such pavements to pieces. With a view of resisting such action, many experiments have been made in recent years in the application of bituminous materials, such as coal tar, or asphaltic oils, to macadam streets, or in the use of such materials mixed while hot with broken stone and rolled into place with a steam road roller. The best combination of bituminous materials and the most effective method of construction of this type of pavement have not yet been fully determined.

Granite and Belgian block pavements in streets.—In the collection of these statistics Census agents were instructed to report under the heading "Granite and Belgian block" all kinds of stone-block pavement constructed of "dressed" or "faced" stone blocks. For certain cities stone-block pavements not locally designated as granite or Belgian block pavements were reported separately with descriptive titles; but in the tabulation all of these pavements were placed under the heading "Granite and Belgian block." The stone-block pavements thus tabulated are shown separately in the following table. Figures in italics are estimates.

City number.	CITY, AND KIND OF STONE-BLOCK PAVEMENTS IN STREETS.	Length (miles).	Area (sq. yds.).
	Grand total	250.2	5,661,203
	Sandstone block.		
	Total	44.3	863,720
17	Minneapolis, Minn	20.0	317,317
20	Kansas City, Mo	2.3	*55,746*
26	St. Paul, Minn	8.7	177,454
63	St. Joseph, Mo	0.5	9,932
66	Tacoma, Wash	6.5	158,944
72	Utica, N. Y	5.1	105,706
158	South Omaha, Nebr	1.2	38,621
	Medina.		
	Total	71.5	1,454,061
1	New York, N. Y.[1]	7.6	153,584
25	Rochester, N. Y	31.5	706,883
29	Columbus, Ohio	7.2	128,604
30	Toledo, Ohio	23.1	446,749
42	Grand Rapids, Mich	0.3	6,017
46	Dayton, Ohio	*1.8*	12,147
101	Passaic, N. J	([2])	1,127
	Medina sandstone and ligonier granite.		
67	Youngstown, Ohio	0.4	16,227

[1] Also some "trap" in the Borough of Manhattan, which can not be segregated.
[2] Less than one-tenth of 1 mile.

City number.	CITY, AND KIND OF STONE-BLOCK PAVEMENTS IN STREETS.	Length (miles).	Area (sq. yds.).
	Traprock.		
	Total	18.8	391,300
1	New York, N. Y	2.3	82,123
14	Newark, N. J	11.5	225,588
36	Paterson, N. J	4.3	76,219
101	Passaic, N. J	0.7	7,370
	Limestone block.		
	Total	8.0	140,047
4	St. Louis, Mo	0.1	1,887
12	Cincinnati, Ohio	7.9	138,160
	Block stone on concrete.		
10	Buffalo, N. Y	16.4	678,772
	Block stone on sand.		
10	Buffalo, N. Y	74.4	1,554,749
	Palisade.		
36	Paterson, N. J	1.1	19,456
	Hayden block.		
29	Columbus, Ohio	14.8	298,878
	Basalt.		
122	Sacramento, Cal	0.5	14,080
	Ligonier.		
8	Pittsburgh, Pa	(1)	224,702
	Not designated.		
8	Pittsburgh, Pa	(1)	5,211

[1] Not reported.

Cobblestone pavements in streets.—By cobblestone pavements are meant those pavements composed of round cobblestones or undressed field stones. In some cities pavements made of stones from quarries and faced on one or more sides are called cobblestone pavements. These stones are laid in sand or gravel, present a smooth surface, and often have good wearing qualities. For this report census agents were instructed to report such pavements as granite and Belgian block, and to include as cobblestone pavements only those of naturally rounded stones or undressed field stones. Only a very small mileage of cobblestone pavement, as defined by the Census Office instructions for 1909, has been laid in recent years, and of the total mileage reported nearly half was for Baltimore, Md.

Brick pavements in streets.—Next to sheet asphalt, the largest mileage of durable pavement reported was of brick, though the mileage of this pavement is not much in excess of that reported for granite and Belgian block. Nearly all cities reported a greater or less area of brick pavements. In many instances the brick pavements, especially those first laid, are composed of soft or only moderately hard brick. At the present time, cities are usually laying vitrified paving brick, placing these upon a concrete foundation.

Vitrified-brick pavements are smooth and durable, easily cleaned, and not excessively noisy. They are satisfactory for residential and business districts, where the traffic is moderate. Under such conditions and when properly laid on a concrete foundation the estimated life of these pavements is approximately 15 years.

Creosoted wood-block pavements in streets.—The total mileage of creosoted wood-block pavements reported is small, and most of that mileage has been laid in recent years. Only three cities—Minneapolis, Minn., New York, N. Y., and Indianapolis, Ind.—reported more than 20 miles each of this pavement. Most of the other cities with creosoted wood-block pavements reported only a small mileage. In many cases these pavements have been laid for experimental purposes, and in many cases they have been laid on bridges. The initial cost of these pavements is relatively large, but when laid on a solid concrete foundation they have shown excellent wearing qualities, are the least noisy of any durable pavement, and are as easy to clean as sheet-asphalt pavements.

Untreated wood-block pavements in streets.—The untreated wood-block pavements reported are a survival of earlier days. Practically no such pavements are being laid at the present time, nor have been for a number of years. The wood most frequently used was cedar. Of the total mileage, 86.3 per cent was reported for the cities of Group I, and more than half of the total was for Chicago alone.

Other durable pavements in streets.—The mileage and area of the other kinds of pavements included in Table 21 as durable are shown in the following table:

City number.	CITY, AND KIND OF SPECIFIED DURABLE PAVEMENTS IN STREETS.	Length (miles).	Area (sq. yds.).
	Grand total	206.7	2,931,154
	Hassan.		
	Total	15.7	303,069
28	Portland, Oreg	3.6	63,244
31	Worcester, Mass	1.2	18,506
38	Fall River, Mass	0.3	5,458
44	Lowell, Mass	0.4	9,832
45	Cambridge, Mass	0.8	22,329
58	Lynn, Mass	1.6	40,149
63	St. Joseph, Mo	3.1	62,767
64	Troy, N. Y	0.9	15,467
70	Somerville, Mass	1.8	36,802
90	Portland, Me	1.0	15,225
124	Haverhill, Mass	0.7	7,802
151	Taunton, Mass	0.3	5,428
	Hassam cement.		
5	Boston, Mass	0.2	2,747
	Cement.		
	Total	0.9	13,312
57	Salt Lake City, Utah	0.2	3,312
103	Mobile, Ala	0.7	10,000
	Concrete.		
	Total	7.9	143,419
1	New York N. Y	0.1	558
2	Chicago Ill	5.0	79,520
37	Omaha, Nebr	0.2	2,972
39	Memphis, Tenn	2.2	51,022
109	Springfield, Ill	0.2	3,687
137	Kalamazoo, Mich	0.2	5,660
	Cement and concrete.		
	Total	4.1	92,572
34	New Haven, Conn	0.9	17,510
42	Grand Rapids, Mich	1.3	30,460
59	Wilmington, Del	1.8	42,906
77	Manchester, N. H	0.1	1,630

City number.	CITY, AND KIND OF SPECIFIED DURABLE PAVEMENTS IN STREETS.	Length (miles).	Area (sq. yds.).
	Granitoid.		
	Total	7.2	136,761
15	New Orleans, La	2.8	64,533
66	Tacoma, Wash	0.3	3,173
68	Duluth, Minn	0.8	11,327
145	Knoxville, Tenn	3.3	57,728
	Granolithic.		
3	Philadelphia, Pa	12.8	72,726
	Slag block.		
	Total	9.3	111,706
1	New York, N. Y	3.5	69,426
3	Philadelphia, Pa	5.8	42,280
	Mineral rubber.		
15	New Orleans, La	2.5	52,741
	Rubble.		
55	Camden, N. J	12.9	188,687
	Macadam and concrete.		
106	Saginaw, Mich	0.5	8,846

Nondurable pavements in streets, classified by kind of surface.—The class of nondurable pavements is composed of those with oil or water bound surface. Its most important subclasses are the following: Oil-bound macadam, water-bound macadam, oil-bound gravel, and water-bound gravel.

Oil-bound macadam pavements in streets.—This class of pavements includes all macadam pavements in whose construction oil was used as a binder, but not those oiled subsequent to construction for the prevention of dust. The class last mentioned have been tabulated as water-bound macadam. Only 66.9 miles of oil-bound macadam streets were reported for all of the cities covered in this report, nearly two-thirds of this total mileage being reported for Sacramento, Cal.

Water-bound macadam pavements in streets.—Water-bound macadam streets include nearly all of the macadam streets reported. Strictly speaking, no binder has been used in the construction of this pavement, such streets being ordinarily spoken of as water-bound macadam streets merely to differentiate them from the tar and oil-bound macadam streets. A very large number of cities reported streets of this kind. The mileage reported does not include that of macadam drives within park areas, of which there is a very considerable mileage in a large number of cities.

The figures of the tables of this report relating to water-bound macadam paved streets are generally for streets covered with a firm covering several inches in thickness; but for a few cities the local records include as paved streets those with only a very thin and uneven coating of broken stone, a kind of streets which most cities class as unpaved. So far as the figures of this report duplicate these inaccuracies of local records they incorrectly magnify the length and area of paved streets and present an imperfect statement of the length and area of unpaved streets.

Water-bound gravel pavements in streets.—Many cities have improved a large mileage of their streets in the residential sections by covering the natural earth with a layer of gravel. No binder is used to hold the particles of gravel together, but these streets are usually called water-bound gravel streets in order to distinguish them from oil-bound gravel streets. Of the 158 cities, 47 reported water-bound gravel streets. The statement made in the last paragraph with reference to faulty local records concerning water-bound macadam is equally true with reference to water-bound gravel streets.

Other oil or water bound pavements in streets.—The different kinds of pavement with oil or water bound surface included in the column of Table 21, headed "All other," are shown in the following table:

City number.	CITY, AND KINDS OF NONDURABLE PAVEMENTS IN STREETS.	Length (miles).	Area (sq. yds.).
	Grand total	501.9	10,369,475
	Oil-bound gravel.		
	Total	208.7	4,674,605
18	Los Angeles, Cal	179.7	4,224,000
44	Lowell, Mass	5.3	63,842
61	Des Moines, Iowa	0.5	6,763
126	Salem, Mass	23.2	380,000
	Shell.		
	Total	102.3	1,822,341
15	New Orleans, La	28.2	495,030
39	Memphis, Tenn	0.7	14,414
69	Houston, Tex	5.2	66,928
81	Norfolk, Va	12.0	158,000
85	Savannah, Ga	2.4	46,539
96	Jacksonville, Fla	18.7	329,120
136	Chester, Pa	3.1	55,260
140	Galveston, Tex	32.0	657,056
	Chert.		
	Total	22.0	287,549
15	New Orleans, La	3.6	63,360
120	Chattanooga, Tenn	18.4	224,189
	Disintegrated or decomposed granite.		
	Total	97.6	2,133,950
18	Los Angeles, Cal	3.7	93,887
27	Denver, Colo	93.9	2,040,063
	Shell and cinders.		
89	Charleston, S. C	2.1	39,408
	Macadam and chert.		
32	Atlanta, Ga	53.0	1,088,267
	Imperial crude oil and dirt.		
20	Kansas City, Mo	0.7	12,069
	Oilroid.		
49	Spokane, Wash	0.1	866
	Trapoid.		
49	Spokane, Wash	1.0	37,661
	Slag.		
2	Chicago, Ill	6.5	104,000
	Not specified.		
	Total	7.9	168,761
2	Chicago, Ill	0.6	9,920
9	Detroit, Mich	1.8	29,774
18	Los Angeles, Cal	5.5	129,067

Comparisons between 1907 and 1909.—In the following table is shown for 1907 and 1909 the areas of different classes of pavement in the 158 cities covered by this report, and the increase or decrease in specified kinds during the period. The classification of the table is that of the 1907 report, which was not so detailed as that for 1909.

CHARACTER OF PAVEMENT.	1909	1907	INCREASE.	
			Total.	Per cent.
Total	387,471,590	374,908,992	12,562,598	3.4
Sheet asphalt and block asphalt	88,645,677	75,437,652	13,208,025	17.5
Bitulithic and tar-bound macadam	7,326,791	3,938,276	3,388,515	86.0
Granite and Belgian block	51,414,901	48,701,436	2,713,465	5.6
Cobblestone	9,083,397	13,998,802	[1] 4,915,405	[1] 35.1
Brick	53,870,578	46,224,419	7,646,159	16.5
Creosoted wood block and untreated wood block	13,660,417	16,767,918	[1] 3,107,501	[1] 18.5
Oil and water bound macadam	108,956 208	109,578,350	[1] 622,142	[1] .6
Water-bound gravel	41,212,992	45,595,430	[1] 4,382,438	[1] 9.6
All other	13,300,629	14,666,709	[1] 1,366,080	[1] 9.3

[1] Decrease.

Bitulithic and tar-bound macadam, though comprising but a small proportion of the total area of pavement reported, showed by far the highest percentage of increase from 1907 to 1909. The marked decrease in the area of cobblestone pavement reported is in part explained by the fact that in certain cities pavement locally reported as cobblestone in 1907 was reported as granite or Belgian block in 1909.

Average life of street pavements.—In the tables which follow is shown the average life of sheet-asphalt, brick, creosoted wood-block, and bitulithic and other tar-bound macadam pavements. In most cases the figures given are merely estimates, though in some they represent the actual life of pavements in certain streets. The tables present different estimates for the business and residence sections. Many factors which could not be taken account of in the figures presented affect the length of life of pavements. Among these may be mentioned the foundation and thickness of the pavement, the grade of the streets, and, perhaps most important of all, the amount of traffic and the kind of traffic upon the streets.

The most complete reports were obtained for the average life of brick pavements. In practically all cities brick is one of the oldest paving materials and one of the most extensively used, and hence data with reference to its average life is comparatively plentiful. The average life of brick pavement in Jacksonville, Fla., is reported to have been from 40 to 50 years. Creosoted wood block was apparently the most durable paving material in St. Louis; the other three classes of material having been reported as somewhat less durable. The average life of the creosoted wood-block pavement in Minneapolis could not be ascertained, since none had been worn out. The estimated life of this pavement in Indianapolis, in the residence section, was somewhat greater than that of sheet asphalt in the same section, but apparently somewhat less than that of brick.

City number.	CITY.	AVERAGE—ESTIMATED LIFE IN YEARS OF—			
		Sheet-asphalt pavement.		Brick pavement.	
		Business section.	Residence section.	Business section.	Residence section.
1	New York, N. Y	8 to 15	10 to 20	10 to 12	10 to 12
3	Philadelphia, Pa	5	10	10	15
4	St. Louis, Mo	7 to 15	10 to 20	6 to 14	10 to 20
5	Boston, Mass	10	15	5	10
6	Baltimore, Md	6	12	6	18
7	Cleveland, Ohio	...	12 to 15	...	25
8	Pittsburgh, Pa	5 to 10	15 to 25	...	...
9	Detroit, Mich	6 to 8	8 to 12	8 to 12	...
10	Buffalo, N. Y	17	17	10	14
11	San Francisco, Cal	...	30	...	...
13	Milwaukee, Wis	8 to 10	12 to 15	10	15
14	Newark, N. J	...	...	10 to 15	12 to 15
15	New Orleans, La	10 to 12	15 to 20	15	20
16	Washington, D. C	22	22	...	...
17	Minneapolis, Minn	10	...	10	...
18	Los Angeles, Cal	10	15	12	20
19	Jersey City, N. J	5	5 to 10	...	...
20	Kansas City, Mo	8	15	7	17
21	Indianapolis, Ind	10	12	10	25
22	Louisville, Ky	8 to 10	15 to 17	6 to 8	12
24	Providence, R. I	...	...	15	...
25	Rochester, N. Y	15	22	15	25
26	St. Paul, Minn	14	24	...	...
27	Denver, Colo	8	12	...	...
28	Portland, Oreg	5	10	...	...
29	Columbus, Ohio	10 to 12	12 to 15	15 to 20	17 to 20
30	Toledo, Ohio	10	20	10	25
32	Atlanta, Ga	10 to 12	12 to 15	10 to 15	20 to 30
33	Syracuse, N. Y	12	17	20	25
34	New Haven, Conn	...	...	7 to 25	10 to 20
35	Scranton, Pa	10	13	9	...
36	Paterson, N. J	5 to 10	10 to 12	10 to 15	...
37	Omaha, Nebr	10	15	12	20
38	Fall River, Mass	6	...	...	...
39	Memphis, Tenn	10	20	12	20
41	Oakland, Cal	15	25	...	...
42	Grand Rapids, Mich	10	14	16	20
43	Nashville, Tenn	...	...	10	15
45	Cambridge, Mass	12	...	10 to 15	10 to 15
46	Dayton, Ohio	8	10	10	15
47	Albany, N. Y	10	15	15	20
48	Bridgeport, Conn	...	...	5	10
49	Spokane, Wash	14	13	...	...
50	Hartford, Conn	10	12	...	...
51	Reading, Pa	10	10	...	10
53	San Antonio, Tex	10	15	18	30
55	Camden, N. J	13 to 15	13 to 18	6 to 18	6 to 18
56	Dallas, Tex	...	...	10	15
57	Salt Lake City, Utah	18	28	...	...
59	Wilmington, Del	...	...	10	14
60	Springfield, Mass	12	...	12 to 18	18
61	Des Moines, Iowa	...	...	12	18
63	St. Joseph, Mo	8 to 10	12 to 18	10 to 12	15 to 23
64	Troy, N. Y	10	15	15	25
66	Tacoma, Wash	10	12	7	12
67	Youngstown, Ohio	15	16	15	15
68	Duluth, Minn	...	15	20	...
69	Houston, Tex	7	10	15	25
70	Somerville, Mass	10	15	25	30
71	Kansas City, Kans	9	13	15	25
72	Utica, N. Y	18	...	...	...
73	Waterbury, Conn	...	...	5 to 12	15
75	Schenectady, N. Y	20	12	8	...
76	Hoboken, N. J	12	12	...	...
78	Evansville, Ind	...	10	18	25
79	Birmingham, Ala	...	...	12	18
80	Akron, Ohio	11	...	20	25
83	Wilkes-Barre, Pa	10	15	10	15
84	Erie, Pa	15	20	15	20
85	Savannah, Ga	8 to 12	12 to 18	15 to 20	20 to 30
86	Peoria, Ill	...	10	20	30
88	Fort Wayne, Ind	8	14	20	25
89	Charleston, S. C	...	15	10 to 15	20 to 30
90	Portland, Me	...	...	15	15
92	East St. Louis, Ill	...	...	14	25
93	Holyoke, Mass	10	10	15	...
95	Johnstown, Pa	...	...	6 to 8	12
96	Jacksonville, Fla	...	...	15 to 20	40 to 50
97	Oklahoma City, Okla	12	18	18	25
99	Covington, Ky	8 to 10	...	...	...
100	South Bend, Ind	10	15	20	25
102	Altoona, Pa	7	9	12	...
103	Mobile, Ala	5	6 to 7	...	...
104	Allentown, Pa	10	10	10	10
105	Pawtucket, R. I	...	...	...	20

City number.	CITY.	AVERAGE ESTIMATED LIFE IN YEARS OF—			
		Sheet asphalt pavement.		Brick pavement.	
		Business section.	Residence section.	Business section.	Residence section.
106	Saginaw, Mich	18	18	12	20
107	Canton, Ohio	....	....	20	40
108	Wichita, Kans	12	15	20	25
109	Springfield, Ill	....	....	20	25
110	Binghamton, N. Y	15	....	....	25
112	Sioux City, Iowa	15	20	10	20
113	Little Rock, Ark	10 to 12	15 to 20	5	20
114	Springfield, Ohio	....	....	12	12
115	Atlantic City, N. J	....	....	10	14
116	Bay City, Mich	10	10	11	11
117	Rockford, Ill	5	10	15	18
118	York, Pa	9	9	15	15
119	Lincoln, Nebr	10	15	10	15
120	Chattanooga, Tenn	16	17	18	25
121	Topeka, Kans	10	20	....	25
122	Sacramento, Cal	12	20	....	....
128	Davenport, Iowa	....	....	20	25
129	McKeesport, Pa	....	....	15	25
130	Wheeling, W. Va	....	....	12 to 15	15 to 20
131	Augusta, Ga	....	....	10 to 15	20 to 30
134	Dubuque, Iowa	....	....	22	30
136	Chester, Pa	7	10	7 to 15	7 to 15
140	Galveston, Tex	....	....	12	18
143	Elmira, N. Y	15	18	25	30
144	Quincy, Ill	....	....	15	25
145	Knoxville, Tenn	10	10 to 15	10 to 15	20
146	New Castle, Pa	....	....	15	25
147	Macon, Ga	....	4	17	17
148	Auburn, N. Y	11	15	15	....
149	West Hoboken, N. J	5	5	10	10
150	Joliet, Ill	12	15	15	20
152	Everett, Mass	....	....	15	....
154	Chelsea, Mass	....	....	10	15
155	Joplin, Mo	10	....	10	15
158	South Omaha, Nebr	....	....	20	25

City number.	CITY.	AVERAGE ESTIMATED LIFE IN YEARS OF CREOSOTED WOOD-BLOCK PAVEMENT.	
		Business section.	Residence section.
4	St. Louis, Mo	10 to 20	15 to 25
5	Boston, Mass	15	20
7	Cleveland, Ohio	10 to 12	....
21	Indianapolis, Ind	....	20
23	Seattle, Wash	5	8 to 10
28	Portland, Oreg	8 to 10	....
29	Columbus, Ohio	12 to 14	....
30	Toledo, Ohio	....	30
32	Atlanta, Ga	15 to 18	15 to 20
41	Oakland, Cal	15	....
45	Cambridge, Mass	10	....
60	Springfield, Mass	10	....
93	Holyoke, Mass	8	....
100	South Bend, Ind	....	15
106	Saginaw, Mich	30	30
122	Sacramento, Cal	25	....
140	Galveston, Tex	15	20

City number.	CITY.	AVERAGE ESTIMATED LIFE IN YEARS OF BITULITHIC OR OTHER TAR-BOUND MACADAM PAVEMENT.	
		Business section.	Residence section.
4	St. Louis, Mo	7 to 15	10 to 20
5	Boston, Mass	10	15
6	Baltimore, Md	6	12
7	Cleveland, Ohio	....	5
15	New Orleans, La	5 to 10	10 to 15
18	Los Angeles, Cal	....	12
21	Indianapolis, Ind	....	10
28	Portland, Oreg	10 to 12	....
30	Toledo, Ohio	....	10
32	Atlanta, Ga	8 to 10	10 to 15
33	Syracuse, N. Y	12	17
39	Memphis, Tenn	1	3

City number.	CITY.	AVERAGE ESTIMATED LIFE IN YEARS OF BITULITHIC OR OTHER TAR-BOUND MACADAM PAVEMENT.	
		Business section.	Residence section.
43	Nashville, Tenn	10	15
45	Cambridge, Mass	....	10 to 12
58	Lynn, Mass	15	....
60	Springfield, Mass	4 to 10	10
61	Des Moines, Iowa	2	....
66	Tacoma, Wash	....	10
68	Duluth, Minn	5	10
70	Somerville, Mass	15	20
78	Evansville, Ind	....	4
79	Birmingham, Ala	3 to 4	6 to 8
90	Portland, Me	....	2 to 5
93	Holyoke, Mass	....	10
94	Brockton, Mass	8	12
100	South Bend, Ind	....	10
104	Allentown, Pa	6	....
106	Saginaw, Mich	12	18
108	Wichita, Kans	15	15
116	Bay City, Mich	10	10
136	Chester, Pa	10	10
139	Woonsocket, R. I	5	....
143	Elmira, N. Y	....	3
145	Knoxville, Tenn	3 to 10	5 to 10
148	Auburn, N. Y	12	15
151	Taunton, Mass	6	....
152	Everett, Mass	6	....

Street pavements laid by contract and by city employees.—In Table 22 are shown the areas of street pavements laid by contract and by city employees during the fiscal year 1909. The pavements are divided, as in the other tables of this report, into durable and nondurable. Apparently many cities follow the general policy of having practically all of their paving done by contract, and comparatively few the policy of having it done exclusively by city employees. Only 16.8 per cent of the total area laid during the year was laid by city employees. The cities, however, appeared to be laying a much larger portion of their nondurable pavements than of the durable, laying 36.4 per cent of the former and only 10.1 per cent of the latter.

Cost of pavements laid in 1909.—The table which follows presents the reported average cost in 1909 of laying specified classes of pavement. Cities are arranged according to the reported costs of each class of pavement, which vary greatly for all the classes of pavements, due largely to the fact that reported amounts represent compensation for widely different classes of work. In some cities the reported cost is that of resurfacing only; in others it includes one or more of the following items: Grading of street, excavating for pavement, the removal of old pavement, the laying of new or strengthening of the old concrete foundation, and the construction or resetting of curbs and gutters. The cost is largely influenced by the number of these varying factors, the most important of which are given in footnotes.

COST OF PAVEMENTS LAID IN 1909.

AVERAGE COST OF LAYING SHEET-ASPHALT PAVEMENTS IN 1909.

City number.	City.	Cost per square yard.	City number.	City.	Cost per square yard.
5	Boston, Mass	[1] $3.25	158	South Omaha, Nebr	[2] $1.95
10	Buffalo, N. Y	[1] 3.00	20	Kansas City, Mo	[6] 1.94
12	Cincinnati, Ohio	[1] 2.97	26	St. Paul, Minn	[5] 1.94
72	Utica, N. Y	2.83	97	Oklahoma City, Okla	[3, 4] 1.92
22	Louisville, Ky	[1] 2.77	118	York, Pa	[1] 1.92
98	Bayonne, N. J	[2] 2.75	36	Paterson, N. J	[4] 1.91
9	Detroit, Mich	[3] 2.74	4	St. Louis, Mo	[2] 1.90
49	Spokane, Wash	[4] 2.72	15	New Orleans, La	[6] 1.90
50	Hartford, Conn	[1] 2.70	19	Jersey City, N. J	1.90
57	Salt Lake City, Utah	[2] 2.66	108	Wichita, Kans	[2] 1.90
13	Milwaukee, Wis	[3] 2.46	137	Kalamazoo, Mich	[1] 1.89
47	Albany, N. Y	[2] 2.35	6	Baltimore, Md	[3] 1.87
8	Pittsburgh, Pa	[4] 2.30	145	Knoxville, Tenn	[2] 1.87
120	Chattanooga, Tenn	[2] 2.29	128	Davenport, Iowa	[3] 1.86
7	Cleveland, Ohio	[2, 3] 2.28	29	Columbus, Ohio	[6] 1.85
11	San Francisco, Cal	[5] 2.25	142	Racine, Wis	1.83
138	Montgomery, Ala	[6] 2.25	66	Tacoma, Wash	[6] 1.82
150	Joliet, Ill	[2] 2.25	25	Rochester, N. Y	[1] 1.81
157	Newport, Ky	[2] 2.25	53	San Antonio, Tex	[3] 1.80
28	Portland, Oreg	[6] 2.20	55	Camden, N. J	[7] 1.80
75	Schenectady, N. Y	2.20	88	Fort Wayne, Ind	[2] 1.78
113	Little Rock, Ark	[1] 2.20	116	Bay City, Mich	[1] 1.73
1	New York, N. Y.:		106	Saginaw, Mich	[3, 6] 1.71
	Manhattan Borough	[7] 2.14	23	Seattle, Wash	[6] 1.70
38	Fall River, Mass	[1] 2.10	84	Erie, Pa	[5] 1.70
82	Fort Worth, Tex	[6] 2.09	100	South Bend, Ind	[6] 1.67
61	Des Moines, Iowa	[1] 2.05	87	Harrisburg, Pa	[1] 1.65
35	Scranton, Pa	[6] 2.06	1	New York, N. Y.:	
109	Springfield, Ill	[1] 2.05		Brooklyn Borough	[7] 1.60
112	Sioux City, Iowa	[2] 2.05		Queens Borough	[7] 1.60
14	Newark, N. J	[6] 2.04	16	Washington, D. C	[2, 6] 1.60
83	Wilkes-Barre, Pa	2.04	63	St. Joseph, Mo	[6] 1.60
104	Allentown, Pa	[1] 2.04	117	Rockford, Ill	[2] 1.58
136	Chester, Pa	[1] 2.03	67	Youngstown, Ohio	[2] 1.56
21	Indianapolis, Ind	[2, 3] 2.00	2	Chicago, Ill	[6] 1.49
39	Memphis, Tenn	[2] 2.00	37	Omaha, Nebr	[7] 1.49
41	Oakland, Cal	[3, 4] 2.00	18	Los Angeles, Cal	[6] 1.48
52	Trenton, N. J	[1] 2.00	148	Auburn, N. Y	[5] 1.40
122	Sacramento, Cal	[5] 1.98	1	New York, N. Y.:	
71	Kansas City, Kans	[3, 5] 1.97		Bronx Borough	[2] 1.28
78	Evansville, Ind	[5] 1.97			

AVERAGE COST OF LAYING BLOCK-ASPHALT PAVEMENT IN 1909.

City number.	City.	Cost per square yard.	City number.	City.	Cost per square yard.
1	New York, N. Y.:		1	New York, N. Y.:	
	Brooklyn Borough	[7] $2.73		Bronx Borough	[2] $1.99
	Manhattan Borough	[7] 2.70	80	Akron, Ohio	[2] 1.75
75	Schenectady, N. Y	2.30	85	Savannah, Ga	[6, 3] 1.75
114	Springfield, Ohio	[1] 2.05	16	Washington, D. C	[6, 3] 1.72
67	Youngstown, Ohio	[2] 2.00			

AVERAGE COST OF LAYING BRICK PAVEMENT IN 1909.

City number.	City.	Cost per square yard.	City number.	City.	Cost per square yard.
135	Butte, Mont	[2] $3.80	87	Harrisburg, Pa	[1] $2.00
72	Utica, N. Y	3.68	158	South Omaha, Nebr	[2] 2.00
152	Everett, Mass	[1] 3.25	3	Philadelphia, Pa	[6] 1.98
49	Spokane, Wash	[4] 3.20	108	Wichita, Kans	[2] 1.96
10	Buffalo, N. Y	[1] 3.00	52	Trenton, N. J	[1] 1.95
24	Providence, R. I	[6] 2.89	142	Racine, Wis	1.94
31	Worcester, Mass	[1] 2.87	79	Birmingham, Ala	[1] 1.90
73	Waterbury, Conn	[1] 2.85	113	Little Rock, Ark	[1] 1.90
48	Bridgeport, Conn	[1] 2.79	157	Newport, Ky	[2] 1.90
5	Boston, Mass	[1] 2.75	150	Joliet, Ill	[2] 1.89
98	Bayonne, N. J	[2] 2.41	90	Portland, Me	[5] 2.67
69	Houston, Tex	[6, 3] 2.38	23	Seattle, Wash	[6] 2.60
74	Elizabeth, N. J	[1] 2.36	104	Allentown, Pa	[1] 2.56
64	Troy, N. Y	[5] 2.30	18	Los Angeles, Cal	[6] 2.55
102	Altoona, Pa	[1] 2.28	19	Jersey City, N. J	[1] 2.50
75	Schenectady, N. Y	2.27	139	Woonsocket, R. I	[1] 2.50
119	Lincoln, Nebr	[4] 2.27	154	Chelsea, Mass	2.50
103	Mobile, Ala	[1] 2.25	9	Detroit, Mich	[6] 2.49
138	Montgomery, Ala	[6] 2.25	66	Tacoma, Wash	[6] 2.48
156	La Crosse, Wis	2.25	12	Cincinnati, Ohio	[1] 2.47
6	Baltimore, Md	[3] 2.24	137	Kalamazoo, Mich	[1] 1.88
115	Atlantic City, N. J	[5] 2.24	155	Joplin, Mo	[1] 1.88
17	Minneapolis, Minn	[6, 3] 2.23	153	Oshkosh, Wis	1.87
15	New Orleans, La	[6] 2.20	8	Pittsburgh, Pa	[1] 1.85
13	Milwaukee, Wis	[3] 2.18	22	Louisville, Ky	[1] 1.85
14	Newark, N. J	[6] 2.18	140	Galveston, Tex	[6, 3] 1.82
143	Elmira, N. Y	[2] 2.16	43	Nashville, Tenn	[1] 1.80
83	Wilkes-Barre, Pa	2.15	88	Fort Wayne, Ind	[2] 1.78
120	Chattanooga, Tenn	[2] 2.15	134	Dubuque, Iowa	[1] 1.77
131	Augusta, Ga	[1] 2.10	4	St. Louis, Mo	[2] 1.75
111	Lancaster, Pa	[1] 2.08	42	Grand Rapids, Mich	[1] 1.75
147	Macon, Ga	[1] 2.08	117	Rockford, Ill	[2] 1.75
35	Scranton, Pa	[6] 2.07	114	Springfield, Ohio	[1] 1.74
56	Dallas, Tex	[2] 2.06	110	Binghamton, N. Y	[1] 1.73
97	Oklahoma City, Okla	[4, 3] 2.06	25	Rochester, N. Y	[1] 1.72
145	Knoxville, Tenn	[2] 2.06	99	Covington, Ky	[6] 1.72
136	Chester, Pa	[1] 2.05	106	Saginaw, Mich	[6, 3] 1.72
47	Albany, N. Y	[2, 3] 2.04	109	Springfield, Ill	[1] 1.69
37	Omaha, Nebr	[7] 2.03	20	Kansas City, Mo	[6] 1.63
61	Des Moines, Iowa	[1] 2.03	89	Charleston, S. C	[6] 1.60
39	Memphis, Tenn	[2] 2.00	92	East St. Louis, Ill	[2] 1.60

AVERAGE COST OF LAYING BRICK PAVEMENT IN 1909—Continued.

City number.	City.	Cost per square yard.	City number.	City.	Cost per square yard.
116	Bay City, Mich	[1] $1.60	146	New Castle, Pa	[2] $1.40
63	St. Joseph, Mo	[6] 1.55	121	Topeka, Kans	[6] 1.32
29	Columbus, Ohio	[6] 1.54	100	South Bend, Ind	[6] 1.27
78	Evansville, Ind	[5] 1.53	107	Canton, Ohio	[2] 1.26
96	Jacksonville, Fla	[6, 3] 1.53	130	Wheeling, W. Va	[6] 1.25
46	Dayton, Ohio	[6] 1.50	7	Cleveland, Ohio	[2, 3] 1.21
71	Kansas City, Kans	[5, 3] 1.50	129	McKeesport, Pa	[4] 1.20
128	Davenport, Iowa	[2] 1.50	21	Indianapolis, Ind	[3] 1.10
144	Quincy, Ill	[3] 1.50	86	Peoria, Ill	[2] 1.07
67	Youngstown, Ohio	[2] 1.45	80	Akron, Ohio	[2] 1.00

AVERAGE COST OF LAYING GRANITE AND BELGIAN-BLOCK PAVEMENT IN 1909.

City number.	City.	Cost per square yard.	City number.	City.	Cost per square yard.
10	Buffalo, N. Y	[1] $4.25	20	Kansas City, Mo	[6] $2.93
135	Butte, Mont	[2] 4.25	151	Taunton, Mass	[1] 2.91
12	Cincinnati, Ohio	[1] 4.23	80	Akron, Ohio	[2] 2.85
5	Boston, Mass	[1] 4.05	62	Lawrence, Mass	[1] 2.84
15	New Orleans, La	[6] 3.85	1	New York, N. Y.:	
54	New Bedford, Mass	[5] 3.85		Bronx Borough	[2] 2.80
23	Seattle, Wash	[6] 3.80	111	Lancaster, Pa	[1] 2.80
28	Portland, Oreg	[6] 3.75	4	St. Louis, Mo	[2] 2.75
11	San Francisco, Cal	[5, 3] 3.60	67	Youngstown, Ohio	[2] 2.60
66	Tacoma, Wash	[6] 3.57	138	Montgomery, Ala	[6] 2.60
1	New York, N. Y.:		24	Providence, R. I	[6] 2.50
	Brooklyn Borough	[7] 3.51	75	Schenectady, N. Y	2.50
50	Hartford, Conn	[1] 3.50	105	Pawtucket, R. I	[1] 2.50
1	New York, N. Y.:		35	Scranton, Pa	[6] 2.45
	Richmond Borough	[7] 3.37	90	Portland, Me	[5, 3] 2.45
152	Everett, Mass	3.25	154	Chelsea, Mass	2.40
7	Cleveland, Ohio	[2, 3] 3.25	126	Salem, Mass	[5] 2.25
44	Lowell, Mass	[1] 3.24	17	Minneapolis, Minn	[6, 3] 2.22
1	New York, N. Y.:		141	Fitchburg, Mass	[1] 2.08
	Manhattan Borough	[7] 3.14	25	Rochester, N. Y	[1, 2] 2.07
26	St. Paul, Minn	[6] 3.12	8	Pittsburgh, Pa	[1] 2.00
14	Newark, N. J	[6] 3.07	124	Haverhill, Mass	[5] 2.00
63	St. Joseph, Mo	[6] 3.04	74	Elizabeth, N. J	[1] 1.85
22	Louisville, Ky	[1] 3.00	19	Jersey City, N. J	[1] 1.70
31	Worcester, Mass	[1] 3.00	60	Springfield, Mass	[1] 1.24
45	Cambridge, Mass	[1] 3.00	16	Washington, D. C	1.19
94	Brockton, Mass	[1] 3.00	93	Holyoke, Mass	[1] 0.61
70	Somerville, Mass	[1] 2.96	77	Manchester, N. H	[3] 0.55
3	Philadelphia, Pa	[6] 2.94			

AVERAGE COST OF LAYING BITULITHIC PAVEMENT IN 1909.

City number.	City.	Cost per square yard.	City number.	City.	Cost per square yard.
5	Boston, Mass	[1] $3.25	14	Newark, N. J	[6] $2.24
115	Atlantic City, N. J	[5] 2.55	28	Portland, Oreg	[6] 2.20
64	Troy, N. Y	[5] 2.54	13	Milwaukee, Wis	2.18
60	Springfield, Mass	[1] 2.50	4	St. Louis, Mo	[2] 2.15
45	Cambridge, Mass	[1, 2] 2.45	108	Wichita, Kans	[2] 2.15
56	Dallas, Tex	[2] 2.35	41	Oakland, Cal	[3, 4] 2.00
73	Waterbury, Conn	[1] 2.35	59	Wilmington, Del	[1] 1.96
6	Baltimore, Md	[3] 2.28	15	New Orleans, La	[6] 1.95
138	Montgomery, Ala	[6] 2.25	21	Indianapolis, Ind	[2] 1.10

AVERAGE COST OF LAYING UNTREATED WOOD-BLOCK PAVEMENT IN 1909.

City number.	City.	Cost per square yard.	City number.	City.	Cost per square yard.
9	Detroit, Mich	[8] $2.02	153	Oshkosh, Wis	$1.29
142	Racine, Wis	1.98			

AVERAGE COST OF LAYING CREOSOTED WOOD-BLOCK PAVEMENT IN 1909.

City number.	City.	Cost per square yard.	City number.	City.	Cost per square yard.
12	Cincinnati, Ohio	[1] $4.34	42	Grand Rapids, Mich	[1] $3.19
5	Boston, Mass	[1] 4.00	19	Jersey City, N. J	[1] 3.15
76	Hoboken, N. J	[7] 3.52	21	Indianapolis, Ind	[2, 3] 2.90
3	Philadelphia, Pa	[6] 3.49	93	Holyoke, Mass	[1] 2.78
34	New Haven, Conn	[1] 3.45	4	St. Louis, Mo	[2] 2.75
9	Detroit, Mich	3.40	13	Milwaukee, Wis	[2] 2.70
48	Bridgeport, Conn	[1] 3.40	61	Des Moines, Iowa	[1] 2.67
1	New York, N. Y.:		81	Norfolk, Va	[6] 2.60
	Manhattan Borough	[7] 3.34	17	Minneapolis, Minn	[6, 3] 2.58
60	Springfield, Mass	[1] 3.29	36	Paterson, N. J	[4] 2.57
1	New York, N. Y.:		1	New York, N. Y.:	
	Richmond Borough	[7] 3.26		Queens Borough	[7] 2.37
56	Dallas, Tex	[2] 3.25	103	Mobile, Ala	[1] 2.22
14	Newark, N. J	[6] 3.20			

AVERAGE COST OF LAYING TAR-BOUND MACADAM PAVEMENT IN 1909.

City number.	City.	Cost per square yard.	City number.	City.	Cost per square yard.
11	San Francisco, Cal	$2.25	31	Worcester, Mass	[6] $2.25
138	Montgomery, Ala	[6] 2.25	90	Portland, Me	[3] 0.86
68	Duluth, Minn	[1] 1.55	100	South Bend, Ind	[6] 0.80
153	Oshkosh, Wis	1.34	141	Fitchburg, Mass	0.77
6	Baltimore, Md	[3] 1.11	93	Holyoke, Mass	[1] 0.59
145	Knoxville, Tenn	1.10	94	Brockton, Mass	[1] 0.60
124	Haverhill, Mass	[5] 1.07			

---

[1] Price includes cost of curbing, guttering, etc.

[2] Price includes cost of paving only.

[3] Price reported is the average of the highest and the lowest price paid.

[4] Price includes foundations but not grading or curbing.

[5] Price includes cost of removing old pavement and grading but not setting of curb.

[6] Not known whether cost of curbing, guttering, grading, etc., is included.

[7] Price includes cost of removing old pavement.

[8] Price reported is the average of the highest and lowest price paid.

Sheet-asphalt pavements, classified according to the year in which laid.—In Table 23 is shown for those cities for which the date of laying was obtainable the area of sheet-asphalt pavement in streets at the close of the year 1909, classified by the year in which laid. This pavement has been laid extensively in most of the larger cities of the country during the last 10 years, although a few cities have laid but little of it during that period. Thus Minneapolis, Minn., has not laid any since 1901, except a small area resurfaced in 1906. Newark, N. J., has laid little since 1902. In that city this pavement has apparently been superseded by bitulithic or bituminous macadam pavements. It seems probable that the figures for the second column of Table 23 giving the area of sheet-asphalt pavement laid prior to 1900 includes for some cities the areas of streets that were resurfaced in later years, and should therefore have been reported in the succeeding columns for 1900 to 1909. The foundation for these pavements having been laid prior to 1900, their areas have been improperly included in the second column rather than in that for the year in which the resurfacing took place In spite of this probable defect, and the fact that a number of cities have discontinued or practically discontinued the laying of sheet asphalt, the figures of the table show a general increase in the construction and reconstruction of this class of pavement. For the 10 years (1900–1909) the reported area of such pavement constructed or relaid averaged 3,766,875 square yards per year. The areas reported for 1900, 1901, and 1902 were markedly below this average, and that for 1906 slightly below. Those for the other years were above the average, and the figures as a whole indicate a general increase in the area of this class of pavement laid.

Bitulithic and tar-bound macadam pavements, classified according to the year in which laid.—Table 24 shows the area in 1909 of bitulithic and bituminous or tar-bound macadam pavement in streets, classified as far as data were available according to the year in which laid. The table indicates the rapid general increase in the construction of this class of pavement during the period covered by the data presented. It seems probable that some of the bituminous or tar-bound pavements other than bitulithic were constructed as common or water-bound macadam and later treated with tar or other bituminous compound, or with a layer of crushed stone treated with such compound. Especially is this true of the areas shown in the table as constructed prior to 1900. For this reason the figures given in the columns for the period last mentioned may well be disregarded in considering the rapid introduction of bitulithic and other bituminous and tar-bound pavements, as these were but little used prior to 1900.

Creosoted wood-block pavements, classified according to the year in which laid.—In Table 25 is shown for the cities for which the data were obtainable, the area in square yards of creosoted wood-block pavements in use at the close of 1909, classified by the year in which laid. Practically all of these pavements laid in American cities are still in existence. The untreated wood-block pavements laid in earlier years proved comparatively unserviceable, because they were not always laid on a solid foundation, and also because the wood soon decayed. Experiments were made with creosoted wood-block pavements as early as 1900, but only small areas were laid before that date.

Much of the creosoted wood-block pavement in use is on bridges. In many cities it has also been laid on streets, principally for experimental purposes. The largest areas were reported for Minneapolis, Minn., New York, N. Y., and Indianapolis, Ind. In Minneapolis this pavement has come into use in recent years to the exclusion of asphalt pavements. The first creosoted wood-block pavement in that city was laid in 1902 and is still in excellent condition, even though subject to heavy traffic.

Brick pavements, classified according to the year in which laid.—In Table 26 is shown for the cities for which the data were obtainable the area of brick pavements in use at the close of 1909, classified by the year in which laid. There has been a marked increase in the area of brick pavements laid within the last few years, the average for the years 1907 to 1909 being more than twice as great as that for the years 1900 to 1902. Many brick manufacturers have taken pains to manufacture a hard paving brick, which, when laid on a solid foundation, has proved very durable. The use of brick pavement varies greatly in different cities, due partly, no doubt, to the varying accessibility of a supply of suitable brick.

Water-bound macadam pavements, classified according to the year in which laid.—In Table 27 is shown for the cities for which the data were obtainable the area of water-bound macadam pavements in use at the close of 1909, classified by the year in which laid. The table was designed to show whether this class of pavement was being superseded to any extent at the present time by pavements better calculated to withstand automobile traffic. The figures for the 73 cities included in the table show that during the period from 1900 to 1910 there was an average construction of 1,719,060 square yards of this class of pavement. In the first half of this period the new construction fell short of this average in the years 1902 and 1904; and in the second half it fell short in the years 1905, 1906, 1907, and 1909, the construction for the last year being markedly lower than for any other year. The figures of the table show a general tendency to decrease the construction of water-bound macadam. This decrease is more than balanced by an increase in the construction of tar and oil bound macadam. These three classes of macadam constitute a very large part (about 29 per cent) of all the pavement reported in Table 19. As a result of the increasing use of oil, tar, and other bituminous compounds as a binding for macadam pavement, there will doubtless be a great decrease during the next few years in the area of water-bound macadam.

UNPAVED STREETS: 1909.

City number.	CITY.	LENGTH OF UNPAVED STREETS.[1]			
		All streets.	Streets with curbs and gutters.	Streets with curbs only.	All other streets.
	Grand total	25,071.5	2,311.6	1,167.6	21,592.3
	Group I	6,540.6	328.8	258.0	5,953.8
	Group II	7,681.1	1,098.6	501.9	6,080.6
	Group III	6,311.2	507.4	298.5	5,505.3
	Group IV	4,538.6	376.8	109.2	4,052.6

GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.

City number.	CITY.	All streets.	Streets with curbs and gutters.	Streets with curbs only.	All other streets.
1	New York, N. Y	1,334.7	77.8	249.0	1,007.9
2	Chicago, Ill	1,337.9	...	...	1,337.9
3	Philadelphia, Pa	471.0	...	...	471.0
4	St. Louis, Mo	337.1	...	...	337.1
5	Boston, Mass	4.1	...	...	4.1
6	Baltimore, Md	*26.2*	*5.0*	...	*21.2*
7	Cleveland, Ohio	298.3	0.6	9.0	288.7
8	Pittsburgh, Pa	524.0	...	...	524.0
9	Detroit, Mich	293.9	...	...	293.9
10	Buffalo, N. Y	301.7	...	...	301.7
11	San Francisco, Cal	486.0	...	...	486.0
12	Cincinnati, Ohio	266.0	...	...	266.0
13	Milwaukee, Wis	184.2	184.2	...	...
14	Newark, N. J	85.2	1.2	...	84.0
15	New Orleans, La	500.0	60.0	...	440.0
16	Washington, D. C	90.3	...	...	90.3

GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.

City number.	CITY.	All streets.	Streets with curbs and gutters.	Streets with curbs only.	All other streets.
17	Minneapolis, Minn	462.1	223.6	...	238.5
18	Los Angeles, Cal	514.6	...	171.5	343.1
19	Jersey City, N. J	76.3	25.0	...	51.3
20	Karsas City, Mo	177.0	...	2.0	175.0
21	Indianapolis, Ind	190.5	...	70.0	120.5
22	Louisville, Ky	[2] 91.4	(3)	(3)	91.4
23	Seattle, Wash	1,334.1	448.2	...	885.9
24	Providence, R. I	10.5	...	...	10.5
25	Rochester, N. Y	152.7	...	...	152.7
26	St. Paul, Minn	681.3	...	31.8	649.5
27	Denver, Colo	1,093.6	127.8	166.6	799.2
28	Portland, Oreg	578.0	...	...	578.0
29	Columbus, Ohio	297.3	...	...	297.3
30	Toledo, Ohio	208.6	...	...	208.6
31	Worcester, Mass	...	...	...	...
32	Atlanta, Ga	121.1	...	...	121.1
33	Syracuse, N. Y	191.3	...	...	191.3
34	New Haven, Conn	111.0	...	...	111.0
35	Scranton, Pa	119.0	...	...	119.0
36	Paterson, N. J	*73.8*	*50.0*	...	*23.8*
37	Omaha, Nebr	421.5	1.5	...	420.0
38	Fall River, Mass	48.5	24.5	...	24.0
39	Memphis, Tenn	*103.0*	*8.0*	...	95.0
40	Richmond, Va	...	...	...	...
41	Oakland, Cal	46.7	...	...	46.7
42	Grand Rapids, Mich	111.5	...	...	111.5
43	Nashville, Tenn	142.6	...	10.0	132.6
44	Lowell, Mass	66.1	...	...	66.1
45	Cambridge, Mass	...	...	...	...
46	Dayton, Ohio	257.0	190.0	50.0	17.0

GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.

City number.	CITY.	All streets.	Streets with curbs and gutters.	Streets with curbs only.	All other streets.
47	Albany, N. Y	44.0	...	...	44.0
48	Bridgeport, Conn	106.0	50.0	...	56.0
49	Spokane, Wash	*907.0*	...	...	*907.0*
50	Hartford, Conn	10.0	...	...	10.0
51	Reading, Pa	59.0	...	...	59.0
52	Trenton, N. J	84.0	...	...	84.0
53	San Antonio, Tex	407.8	...	...	407.8
54	New Bedford, Mass	58.7	...	...	58.7
55	Camden, N. J	*150.0*	...	...	*150.0*
56	Dallas, Tex	*257.5*	*5.0*	*12.5*	*240.0*
57	Salt Lake City, Utah	351.0	39.5	...	311.5
58	Lynn, Mass	(3)	...	...	(3)
59	Wilmington, Del	30.4	...	...	30.4
60	Springfield, Mass	15.0	...	...	15.0
61	Des Moines, Iowa	365.0	...	...	365.0
62	Lawrence, Mass	81.0	...	...	81.0
63	St. Joseph, Mo	115.3	...	...	115.3
64	Troy, N. Y	[2] *47.4*	*3.0*	(3)	44.4
65	Yonkers, N. Y	23.6	1.5	...	22.1
66	Tacoma, Wash	151.5	151.5	...	...
67	Youngstown, Ohio	104.0	...	...	104.0
68	Duluth, Minn	118.4	118.4	...	...
69	Houston, Tex	104.8	...	...	104.8
70	Somerville, Mass	20.6	...	...	20.6
71	Kansas City, Kans	161.0	...	0.5	160.5
72	Utica, N. Y	57.3	...	...	57.3
73	Waterbury, Conn	[2] *130.0*	(3)	...	*130.0*
74	Elizabeth, N. J	48.2	48.2	...	...
75	Schenectady, N. Y	(3)	(3)	(3)	(3)
76	Hoboken, N. J	9.2	...	...	9.2
77	Manchester, N. H	159.8	...	...	159.8
78	Evansville, Ind	*72.0*	...	...	*72.0*
79	Birmingham, Ala	99.6	...	...	99.6
80	Akron, Ohio	119.7	1.5	...	118.2
81	Norfolk, Va	57.5	5.0	...	52.5
82	Fort Worth, Tex	275.0	...	100.0	175.0
83	Wilkes-Barre, Pa	(3)	(3)	(3)	(3)
84	Erie, Pa	69.0	...	10.0	59.0
85	Savannah, Ga	85.0	...	85.0	...
86	Peoria, Ill	95.8	...	57.5	38.3
87	Harrisburg, Pa	50.0	...	...	50.0
88	Fort Wayne, Ind	*200.0*	...	...	*200.0*
89	Charleston, S. C	31.1	31.1	...	...
90	Portland, Me	*28.4*	*14.2*	...	*14.2*
91	Terre Haute, Ind	88.6	...	...	88.6
92	East St. Louis, Ill	(3)	...	...	(3)
93	Holyoke, Mass	52.7	...	...	52.7
94	Brockton, Mass	81.2	12.5	...	68.7
95	Johnstown, Pa	47.8	...	...	47.8
96	Jacksonville, Fla	76.7	...	25.0	51.7
97	Oklahoma City, Okla	221.0	...	...	221.0
98	Bayonne, N. J	27.5	...	...	27.5
99	Covington, Ky	14.0	...	...	14.0
100	South Bend, Ind	104.8	...	...	104.8
101	Passaic, N. J	[2] 26.0	26.0	(3)	(3)
102	Altoona, Pa	*39.6*	...	*8.0*	31.6
103	Mobile, Ala	81.0	...	...	81.0
104	Allentown, Pa	*40.0*	...	...	*40.0*
105	Pawtucket, R. I	49.7	...	...	49.7

GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.

City number.	CITY.	All streets.	Streets with curbs and gutters.	Streets with curbs only.	All other streets.
106	Saginaw, Mich	*141.7*	...	...	*141.7*
107	Canton, Ohio	*159.4*	27.4	...	*132.0*
108	Wichita, Kans	330.0	110.0	...	220.0
109	Springfield, Ill	108.9	...	...	108.9
110	Binghamton, N. Y	*74.1*	...	*24.7*	*49.4*
111	Lancaster, Pa	28.0	...	...	28.0
112	Sioux City, Iowa	614.4	30.0	6.0	578.4
113	Little Rock, Ark	*162.0*	...	*14.0*	148.0
114	Springfield, Ohio	47.0	5.0	...	42.0
115	Atlantic City, N. J	*30.0*	...	...	*30.0*
116	Bay City, Mich	145.3	...	...	145.3
117	Rockford, Ill	96.0	...	...	96.0
118	York, Pa	29.5	20.0	...	9.5
119	Lincoln, Nebr	162.0	...	...	162.0
120	Chattanooga, Tenn	[2] 75.0	(3)	(3)	75.0
121	Topeka, Kans	188.0	...	...	188.0
122	Sacramento, Cal	39.9	...	...	39.9
123	Malden, Mass	*1.2*	...	...	*1.2*
124	Haverhill, Mass	*110.2*	...	...	*110.2*
125	Pueblo, Colo	233.5	...	11.0	222.5
126	Salem, Mass	8.6	...	...	8.6
127	New Britain, Conn	*55.0*	*19.0*	...	36.0
128	Davenport, Iowa	90.0	...	...	90.0
129	McKeesport, Pa	48.4	...	...	48.4
130	Wheeling, W. Va	13.0	...	...	13.0
131	Augusta, Ga	30.6	...	...	30.6
132	Superior, Wis	75.3	...	...	75.3
133	Newton, Mass	62.0	...	...	62.0
134	Dubuque, Iowa	19.3	...	...	19.3
135	Butte, Mont	90.0	...	...	90.0
136	Chester, Pa	53.4	35.6	...	17.8
137	Kalamazoo, Mich	104.0	...	...	104.0
138	Montgomery, Ala	150.2	13.2	...	137.0
139	Woonsocket, R. I	32.3	...	...	32.3
140	Galveston, Tex	85.0	...	24.0	61.0
141	Fitchburg, Mass	[2] 113.8	(3)	(3)	113.8
142	Racine, Wis	*57.0*	...	...	*57.0*
143	Elmira, N. Y	*62.2*	...	*25.0*	*37.2*
144	Quincy, Ill	54.0	...	...	54.0
145	Knoxville, Tenn	*55.0*	*15.0*	...	*40.0*
146	New Castle, Pa	120.0	...	...	120.0
147	Macon, Ga	55.5	2.0	1.5	52.0
148	Auburn, N. Y	*30.0*	...	...	*30.0*
149	West Hoboken, N. J	4.6	3.4	...	1.2
150	Joliet, Ill	40.8	...	3.0	37.8
151	Taunton, Mass	56.3	...	...	56.3
152	Everett, Mass	3.6	...	...	3.6
153	Oshkosh, Wis	[2] *25.0*	*25.0*	(3)	(3)
154	Chelsea, Mass	5.0	...	...	5.0
155	Joplin, Mo	(3)	...	...	(3)
156	La Crosse, Wis	70.2	70.2	...	...
157	Newport, Ky	2.4	...	...	2.4
158	South Omaha, Nebr	90.0	1.0	...	89.0

---

[1] Exclusive of roadways in parks.

[2] Incomplete.

[3] Not reported.

Unpaved streets.—The mileage of streets with unpaved surface as reported by 150 cities is shown in the table preceding. The reports for some cities were incomplete, while for others they included streets that had been platted or surveyed, but which were either not graded or only partially so, and were not open to travel. Of the total mileage of unpaved streets reported, 2,311.6 miles were provided with curbs and gutters and 1,167.6 miles with curbs only. Of the mileage without curbs and gutters it is probable that only a small percentage had been graded.

Statistics of alleys.—In Table 28 the reported length and area of alleys at the close of 1909 in cities covered by this report are classified according to character of surface. The alleys comprehended by the table include such highways as are reported under that designation in local reports. For 56 cities no report for alleys was obtainable, and for 24 others alleys were reported with streets. For many other cities the report for alleys was incomplete; for some both the length and area were estimates, and for others paved alleys only were reported.

The following table shows the different kinds of pavement of alleys tabulated in the column headed "All other," in Table 28, and gives the mileage and area of each class:

City number.	CITY, AND CHARACTER OF DURABLE PAVEMENT IN ALLEYS.	Length of alleys (miles).	Area of alleys (square yards).
	Grand total	192.2	1,810,389
	Cobblestone.		
	Total	126.2	1,228,771
6	Baltimore, Md	108.6	755,850
9	Detroit, Mich	11.2	125,061
14	Newark, N. J	0.1	[1] 300
16	Washington, D. C	([2])	280,064
25	Rochester, N. Y	0.5	3,932
47	Albany, N. Y	0.4	4,200
81	Norfolk, Va	3.0	39,767
83	Wilkes-Barre, Pa	0.5	3,666
86	Peoria, Ill	0.2	1,944
116	Bay City, Mich	0.9	4,600
122	Sacramento, Cal	0.8	9,387
	Boulder.		
	Total	37.6	346,907
22	Louisville, Ky	2.6	18,374
46	Dayton, Ohio	35.0	328,533
	Concrete.		
	Total	19.1	162,898
20	Kansas City, Mo	0.8	6,371
27	Denver, Colo	10.9	98,348
39	Memphis, Tenn	0.4	3,660
46	Dayton, Ohio	5.1	43,438
63	St. Joseph, Mo	0.2	1,941
119	Lincoln, Nebr	0.1	525
132	Superior, Wis	1.5	8,448
150	Joliet, Ill	0.1	167
	Cement.		
	Total	1.1	7,401
57	Salt Lake City, Utah	0.9	5,697
81	Norfolk, Va	0.1	1,000
125	Pueblo, Colo	0.1	704
	Granitoid.		
	Total	1.6	13,398
4	St. Louis, Mo	1.4	11,638
145	Knoxville, Tenn	0.2	1,760
	Wood block.		
	Total	0.9	7,518
5	Boston, Mass	0.1	98
17	Minneapolis, Minn	0.2	2,830
20	Kansas City, Mo	0.1	1,103
26	St. Paul, Minn	0.1	357
88	Fort Wayne, Ind	0.4	3,130
	Creosoted wood block.		
17	Minneapolis, Minn	0.2	1,665
	Bitumen.		
11	San Francisco, Cal	2.9	17,023
	Stone.		
39	Memphis, Tenn	1.6	15,112
	Tar concrete.		
44	Lowell, Mass	0.2	1,800
	Tar macadam.		
68	Duluth, Minn	0.2	2,779
	Concrete and macadam.		
37	Omaha, Nebr	0.6	5,117

[1] Kinds of material not reported for total.
[2] Not reported.

The character of the surface of the alleys tabulated in Table 28 under the heading "Alleys with nondurable surface" is shown in the following table:

City number.	CITY, AND CHARACTER OF NONDURABLE PAVEMENTS IN ALLEYS.	Length (miles).	Area (square yards).
	Grand total	209.8	1,669,096
	Macadam.		
	Total	15.7	188,579
14	Newark, N. J	0.1	1,450
20	Kansas City, Mo	0.2	1,916
26	St. Paul, Minn	0.1	1,320
122	Sacramento, Cal	2.1	25,109
134	Dubuque, Iowa	10.9	128,578
155	Joplin, Mo	2.3	30,206
	Water bound macadam.		
	Total	73.3	512,320
22	Louisville, Ky	18.9	133,267
43	Nashville, Tenn	54.4	379,053
	Wood block and macadam.		
2	Chicago, Ill	71.7	501,900
	Cinders.		
86	Peoria, Ill	44.9	428,476
	Kind not reported.		
27	Denver, Colo	4.2	37,821

Asphalt repair plants operated by cities.—Instead of being dependent upon contractors for the repair of asphalt pavement, many cities prefer to own and operate asphalt repair plants. Of the total of 158 cities, 24 reported the operation of such plants, of which number 1 was rented and 23 owned by the city. Information with respect to these plants and the number of square yards of pavement repaired during 1909 is shown in the following table. Figures in italics are estimates.

City number.	CITY.	Original outlay for plant.	Amount (square yards) of repairing done during year.
	Total	$336,155	1,283,488
15	New Orleans, La	77,202	[1]
9	Detroit, Mich	45,000	254,845
1	New York, N. Y	38,280	[2]
23	Seattle, Wash	31,625	4,439
12	Cincinnati, Ohio	21,000	53,276
21	Indianapolis, Ind	20,558	79,976
11	San Francisco, Cal	16,809	593,696
8	Pittsburgh, Pa	*16,631*	182,770
37	Omaha, Nebr	15,000	21,724
29	Columbus, Ohio	15,000	17,322
46	Dayton, Ohio	12,000	*20,000*
68	Duluth, Minn	9,000	....
30	Toledo, Ohio	[3] 5,602	8,247
69	Houston, Tex	3,500	10,458
67	Youngstown, Ohio	1,500	4,803
13	Milwaukee, Wis	1,275	6,002
121	Topeka, Kans	*1,200*	11,809
14	Newark, N. J	1,197	[1]
7	Cleveland, Ohio	1,100	7,457
42	Grand Rapids, Mich	835	4,164
91	Terre Haute, Ind	566	[1]
63	St. Joseph, Mo	500	....
120	Chattanooga, Tenn	475	*2,500*
150	Joliet, Ill	300	....

[1] No record.

[2] 158,218 cubic feet of wear surface, 45,279 cubic feet of binder, and 15,084 cubic feet of concrete.

[3] Rented.

Quarries operated by cities.—A total of 20 cities each reported the operation of one or more quarries from which stone was taken to be used in highway work during 1909. Information with respect to these quarries and the number of cubic yards of stone removed during the year is shown in the following table. Figures in italics are estimates.

City number.	CITY.	QUARRIES.	
		Number.	Quantity (cubic yards) of stone removed.
	Total	31	313,211
4	St. Louis, Mo	1	64,628
43	Nashville, Tenn	4	64,130
41	Oakland, Cal	1	30,000
16	Washington, D. C	1	25,480
53	San Antonio, Tex	2	20,000
152	Everett, Mass	1	19,990
148	Auburn, N. Y	1	15,000
70	Somerville, Mass	2	11,126
117	Rockford, Ill	1	10,416
32	Atlanta, Ga	2	9,357
22	Louisville, Ky	2	*9,000*
144	Quincy, Ill	1	7,000
131	Augusta, Ga	1	6,215
133	Newton, Mass	2	5,967
77	Manchester, N. H	1	*5,000*
124	Haverhill, Mass	2	*3,556*
20	Kansas City, Mo	1	2,678
68	Duluth, Minn	1	2,100
71	Kansas City, Kans	1	864
134	Dubuque, Iowa	3	714

Gravel pits operated by cities.—A total of 15 cities each reported the operation of gravel pits from which gravel was taken during 1909 for use in highway work. Information with respect to these pits and the quantity of gravel removed is shown in the following table. Figures in italics are estimates.

City number.	CITY.	GRAVEL PITS.	
		Number.	Quantity (cubic yards) of gravel removed.
	Total	49	132,439
66	Tacoma, Wash	1	36,493
53	San Antonio, Tex	4	*20,000*
94	Brockton, Mass	4	18,333
27	Denver, Colo	3	12,364
40	Richmond, Va	1	12,000
137	Kalamazoo, Mich	4	10,000
58	Lynn, Mass	1	6,372
77	Manchester, N. H	3	6,000
125	Pueblo, Colo	1	4,200
133	Newton, Mass	22	3,239
5	Boston, Mass	1	1,538
138	Montgomery, Ala	1	1,000
93	Holyoke, Mass	1	*500*
29	Columbus, Ohio	1	200
130	Wheeling, W. Va	1	200

Statistics of sidewalks.—In many cities the local records of sidewalks were very imperfect. This was especially true in the case of the sidewalks reported in Table 29, under the heading "All other," which includes those made of gravel, cinders, and similar material. Table 29 gives the length in miles of the different kinds of sidewalks in the 97 cities reporting at the close of 1909, and the mileage laid during 1909. Many cities had no record of the length of sidewalks. In most such cities sidewalks were laid by the property owners, and not under the direction or supervision of the city. The mileage of sidewalks reported for some cities in which sidewalks are laid both by the city and by property owners apparently includes only the length of sidewalks that have been laid by or under the supervision of the city, and of which the city has a record.

Sidewalks are usually laid upon one or both sides of the streets having a paved surface, and for most cities the length of sidewalk reported is more than twice as great as the length of paved streets, the excess representing the sidewalks of the unpaved streets. The laying of the sidewalk on paved streets is usually contemporaneous with the paving of the same, although in some cities there are many miles of sidewalk on unpaved streets.

Under cement sidewalks have been included granolithic sidewalks and all other sidewalks in which Portland or other cement has been used as a binder. The length and kind of sidewalks included in the column "All other" of Table 29 are shown in the following tables. Figures in italics are estimates.

LENGTH OF DIFFERENT KINDS OF SIDEWALKS IN CITIES.

City number.	CITY.	MILES IN LENGTH— At close of year.	MILES IN LENGTH— Laid during year.
	BRICK SIDEWALK.		
	Total	4,380.2	47.8
2	Chicago, Ill	*5.0*	
3	Philadelphia, Pa	1,150.0	
4	St. Louis, Mo	*261.6*	(1)
12	Cincinnati, Ohio	226.2	0.9
16	Washington, D. C	*390.0*	
22	Louisville, Ky	*216.0*	2.4
25	Rochester, N. Y	*0.4*	
28	Portland, Oreg	0.4	
29	Columbus, Ohio	228.0	0.2
31	Worcester, Mass	96.5	
32	Atlanta, Ga	232.0	16.1
37	Omaha, Nebr	158.1	5.1
39	Memphis, Tenn	50.0	
40	Richmond, Va	*80.0*	*2.5*
43	Nashville, Tenn	*115.0*	
45	Cambridge, Mass	(1)	0.9
47	Albany, N. Y	(1)	3.3
57	Salt Lake City, Utah	1.5	
63	St. Joseph, Mo	*60.0*	5.0
69	Houston, Tex	*125.0*	
70	Somerville, Mass	69.3	0.9
71	Kansas City, Kans	*94.6*	1.2
79	Birmingham, Ala	5.2	
84	Erie, Pa	23.6	0.1
86	Peoria, Ill	*126.0*	1.0
88	Fort Wayne, Ind	200.0	
90	Portland, Me	(1)	0.9
96	Jacksonville, Fla	30.0	
97	Oklahoma City, Okla	(1)	2.8
99	Covington, Ky	18.0	
100	South Bend, Ind	*4.0*	
102	Altoona, Pa	*37.1*	3.3
113	Little Rock, Ark	*5.0*	
116	Bay City, Mich	*2.0*	
119	Lincoln, Nebr	*70.0*	0.5
120	Chattanooga, Tenn	*15.0*	
121	Topeka, Kans	*139.5*	
125	Pueblo, Colo	*6.0*	
129	McKeesport, Pa	*30.0*	0.5
130	Wheeling, W. Va	*48.0*	(1)
135	Butte, Mont	(2)	(1)
142	Racine, Wis	*2.0*	(1)
146	New Castle, Pa	*2.0*	
147	Macon, Ga	*8.0*	(1)
148	Auburn, N. Y	*1.0*	
152	Everett, Mass	13.2	0.2
153	Oshkosh, Wis	0.3	
157	Newport, Ky	34.7	

City number.	CITY.	MILES IN LENGTH— At close of year.	MILES IN LENGTH— Laid during year.
	CINDER SIDEWALK.		
	Total	1,781.4	101.4
2	Chicago, Ill	*1,445.0*	97.1
4	St. Louis, Mo	*195.2*	
28	Portland, Oreg	0.2	
29	Columbus, Ohio	20.0	
38	Fall River, Mass	120.0	*4.3*
71	Kansas City, Kans	1.0	
	GRAVEL SIDEWALK.		
	Total	566.7	28.6
26	St. Paul, Minn	3.8	
28	Portland, Oreg	11.2	13.1
37	Omaha, Nebr	0.3	
40	Richmond, Va	*112.0*	10.6
57	Salt Lake City, Utah	6.8	
69	Houston, Tex	*15.0*	
84	Erie, Pa	20.0	
105	Pawtucket, R. I	(2)	3.3
110	Binghamton, N. Y	*2.0*	
130	Wheeling, W. Va	*4.0*	(2)
133	Newton, Mass	205.9	
139	Woonsocket, R. I	(1)	0.6
148	Auburn, N. Y	*2.0*	
151	Taunton, Mass	*141.3*	
152	Everett, Mass	42.4	1.0
	ASPHALT SIDEWALK.		
	Total	24.9	
3	Philadelphia, Pa	1.0	
28	Portland, Oreg	0.5	
49	Spokane, Wash	11.0	
57	Salt Lake City, Utah	6.5	
79	Birmingham, Ala	2.9	
121	Topeka, Kans	*3.0*	
	MISCELLANEOUS SIDEWALK.		
	Total	534.6	4.1
3	Philadelphia, Pa	[3] 30.0	
16	Washington, D. C	[4] *10.0*	
28	Portland, Oreg	(2), (5)	
31	Worcester, Mass	[6] 293.7	
37	Omaha, Nebr	[7] 1.0	
70	Somerville, Mass	[8] 40.1	3.3
79	Birmingham, Ala	[9] 89.4	
101	Passaic, N. J	[10] 70.4	0.8

[1] Not reported.
[2] Less than one-tenth of 1 mile.
[3] Brick and stone.
[4] Asphalt, tile, and all other.
[5] Bitulithic.
[6] Gravel and cinder.
[7] Concrete.
[8] Edgestone and gravel.
[9] Stone.
[10] Bluestone and concrete.

Highway bridges.—The maintenance of bridges forms an important factor in the cost of the general highway service. Some cities have a large number of bridges to maintain, while others have few or none. It is reasonable to expect that the costs of highway maintenance should be somewhat greater in the former class of cities than in the latter. Considerable difficulty was experienced in obtaining data on bridges. Few cities had any tabulated information on the subject, and many could not supply data as to the length and breadth of the same or the paving material used in construction.

Bridges over 50 feet in length.—More detailed information was obtained relative to bridges over 50 feet in length than concerning those under that length, and Table 30 presents statistics with respect to such bridges. Included in the table are data relating to all bridges of this class within the limits of the cities covered by this report, or between the cities and other political divisions, exclusive of bridges within park areas.

MATERIAL OF WHICH BRIDGES ARE CONSTRUCTED.	NUMBER OF BRIDGES.						Length of all bridges (feet).	Area of all bridges (square feet).
	All lengths.	Of specified length in feet.						
		50 to 99.	100 to 249.	250 to 499.	500 and over.	Length not reported.		
Total	2,593	943	831	341	365	113	722,336	33,122,146
Steel or iron	1,557	533	522	213	237	52	470,136	23,035,825
Wood	403	176	131	50	43	3	89,470	2,716,208
Wood and steel or iron	170	55	43	13	39	20	52,939	2,260,186
Plain concrete	64	31	12	10	9	2	13,204	616,955
Reinforced concrete	83	23	34	7	13	6	22,913	1,118,171
Concrete and steel or iron	53	23	14	8	6	2	13,723	681,183
Stone	109	37	40	21	2	9	17,978	839,172
Stone and steel or iron	74	39	14	9	12	....	23,814	1,060,027
Stone and wood	12	8	1	2	1	....	2,466	69,599
All other	68	18	20	8	3	19	15,693	724,820

Bridges over 50 feet in length were reported by 140 cities; each of the cities of over 100,000 population, except Baltimore, Md., for which no report was obtained, reporting at least one. In the table which follows, bridges over 50 feet in length in the cities covered by the report are classified according to material of which constructed and by length of bridge. The table shows that the length and area of steel and iron bridges form nearly two-thirds of the total length and area reported for all bridges. The following table shows the number of bridges over 50 feet in length constructed in part or wholly of concrete, reported by the cities covered by the report in each of the five different geographic divisions, the bridges being classified according to the period in which constructed, as well as by their type; whether plain concrete, reinforced concrete, or concrete and steel or iron:

GEOGRAPHIC DIVISION.	NUMBER OF BRIDGES CONSTRUCTED OF SPECIFIED MATERIALS.														
	Concrete.					Reinforced concrete.					Concrete and steel or iron.				
	Total.	Before 1890.	From 1890 to 1899.	From 1900 to 1909.	Not reported.	Total.	Before 1890.	From 1890 to 1899.	From 1900 to 1909.	Not reported.	Total.	Before 1890.	From 1890 to 1899.	From 1900 to 1909.	Not reported.
United States	64	1	1	57	5	83		7	70	6	54	3	8	39	4
I. North Atlantic	30	1	1	26	2	38		5	27	6	31	3	4	23	1
II. South Atlantic	5			5		7			7		6			6	
III. North Central	23			20	3	28		2	26		17		4	10	3
IV. South Central	1			1		9			9						
V. Western	5			5		1			1						

Inspection of the above table brings out the interesting fact that nearly all concrete bridges have been constructed since 1900 and that most of them are in the cities of the North Atlantic and North Central divisions.

Of the bridges for which figures are shown in Table 30, less than one-third exceeded 250 feet in length. The length given in each case is that stated in the city reports. For iron or steel bridges, in practically all cases the figures include the length, as furnished by the bridge contractor, of the iron or steel portion of the bridge. The length of the approaches to stone or concrete bridges was excluded. The width of a bridge is the width between the railings or parapet walls. The total area was obtained for each bridge by multiplying the length by the width where such information could be obtained, or in case the bridge engineer could not supply such figures his estimate of the area was accepted. In the grand and group totals of this table, data for bridges for Baltimore and for other cities from which only incomplete reports could be obtained have been excluded.

Cost of bridge construction.—Several cities were unable to supply information as to the cost of constructing their bridges, and for many the figures relating to such cost were very imperfect. In some cases the cost of abutments and approaches has been included with the cost of the bridge, and in a few cases also the cost of the land upon which abutments were built. The figures in Table 30 for cities giving a confessedly incomplete report carry a footnote to that effect.

Bridges under 50 feet in length.—In Table 31 are presented statistics of highway bridges under 50 feet in length, except those in park areas, in the cities covered by this report. Cities that had no bridges of this character are omitted from the table. In view of the fact that it is sometimes difficult to differentiate shorter bridges from culverts, the Bureau of the Census instructed its agents in the preparation of this report to class as bridges only those structures whose surfaces formed some portion of the surfaces of streets, thereby excluding those structures which support the beds of roads without constituting a part of their surfaces. The table shows that nearly one-half of the bridges less than 50 feet in length were constructed of wood and that nearly one-fourth were constructed of iron or steel, or the two in combination.

Drawbridges.—Of the total number of bridges reported, 360 were returned as drawbridges. Of this number more than half were over 50 feet in length. Those reported for Rochester, Syracuse, and Utica, N. Y., and Dayton, Ohio, were over canals. In the next table the drawbridges reported are classified by type into bascule or lifting, turning, swivel, or swing, and all other.

City number.	CITY.	NUMBER AND CLASS OF DRAWBRIDGES. Total.	Bascule, or lifting.	Turning, swivel, or swing.	All other.
	Grand total	360	122	200	29
	Group I	190	52	119	19
	Group II	88	55	27	6
	Group III	48	13	32	3
	Group IV	34	2	31	1
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER.				
1	New York, N. Y	35	9	20	6
2	Chicago, Ill	48	23	25	
3	Philadelphia, Pa	4		4	
5	Boston, Mass	25		12	13
7	Cleveland, Ohio	10	2	8	
9	Detroit, Mich	1		1	
10	Buffalo, N. Y	7	4	3	
11	San Francisco, Cal	3	1	2	
12	Cincinnati, Ohio	1		1	
13	Milwaukee, Wis	23	11	12	
14	Newark, N. J	4		4	
15	New Orleans, La	27	1	26	
16	Washington, D. C	2	1	1	
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000.				
23	Seattle, Wash	3		3	
24	Providence, R. I	3		3	
26	Rochester, N. Y	11	11		
28	Portland, Oreg	3	1	2	
30	Toledo, Ohio	9		9	
36	Syracuse, N. Y	13	10		3
34	New Haven, Conn	5	1	4	
38	Fall River, Mass	2	1	1	
41	Oakland, Cal	4		4	
42	Grand Rapids, Mich	1		1	
45	Cambridge, Mass	4	1		3
46	Dayton, Ohio	30	30		
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000.				
47	Albany, N. Y	3	2		1
48	Bridgeport, Conn	4		4	
50	Hartford, Conn	1		1	
54	New Bedford, Mass	2		2	
55	Camden, N. J	4	1	3	
58	Lynn, Mass	1	1		
59	Wilmington, Del	4		4	
64	Troy, N. Y	3		3	
66	Tacoma, Wash	2		2	
68	Duluth, Minn	2		1	1
69	Houston, Tex	3		3	
72	Utica, N. Y	10	6	3	1
75	Schenectady, N. Y	2	2		
81	Norfolk, Va	1		1	
86	Peoria, Ill	2		2	
90	Portland, Me	4	1	3	
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000.				
106	Saginaw, Mich	6	1	5	
115	Atlantic City, N. J	1		1	
116	Bay City, Mich	6		6	
123	Malden, Mass	1	1		
124	Haverhill, Mass	3		3	
126	Salem, Mass	3		2	1
131	Augusta, Ga	1		1	
132	Superior, Wis	2		2	
142	Racine, Wis	5		5	
151	Taunton, Mass	1		1	
153	Oshkosh, Wis	4		4	
156	La Crosse, Wis	1		1	

Elevated street railways.—The following exhibit shows the mileage of streets with elevated street railways in the cities covered by this report. Only the mileage of the elevated railways over public highways is reported, and not the total mileage of such railways in the given cities:

City number.	CITY.	Total mileage.
	Total	81.07
1	New York, N. Y	46.14
2	Chicago, Ill	[1] 17.31
5	Boston, Mass	8.57
3	Philadelphia, Pa	4.55
20	Kansas City, Mo	2.11
76	Hoboken, N. J	1.00
6	Baltimore, Md	0.70
71	Kansas City, Kans	0.69

[1] Includes 6.24 miles in alleys.

Steam-railroad crossings.—In the table which follows are shown the number of steam-railroad crossings at grade, the number and length of railroad bridges over highways, the number and length of steam-railroad tunnels, and the miles of streets traversed by steam-railroad tracks in the cities covered by this report. For several cities it was impossible to obtain the number of steam-railroad crossings at grade because of incomplete records. Within recent years a very large number of such crossings, especially in the eastern cities of the country, have been abolished by means of bridges carrying the highways over the railroad tracks or the railroad tracks over the highways. Many of the railroad crossings at grade in Massachusetts cities have been abolished in this manner in recent years in consequence of a state law which requires a certain number to be abolished each year.

The length of streets traversed by steam-railroad tracks includes only that of such streets open to public travel. These tracks are used principally in switching operations.

City number.	CITY.	Number of steam railroad crossings at grade.	STEAM RAILROAD BRIDGES OVER HIGHWAYS.		STEAM RAILROAD TUNNELS.		Length of streets traversed by steam railroad tracks (miles).
			Number.	Total length (feet).	Number.	Total length (feet).	
	Grand total	10,084	1,887	184,969	64	125,670	407.3
	Group I	2,428	1,186	116,577	32	82,615	101.0
	Group II	3,023	265	26,227	22	34,955	92.9
	Group III	2,225	297	28,682	6	5,280	109.5
	Group IV	2,408	139	13,483	4	2,820	103.9
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.						
1	New York, N. Y	302	119	25,938	6	23,866	16.5
2	Chicago, Ill	461	504	33,264			12.2
3	Philadelphia, Pa	162	216	20,524	13	8,923	(1)
4	St. Louis, Mo	150	5	300	1	5,069	23.7
5	Boston, Mass	(1)			(1)	(1)	(1)
6	Baltimore, Md	48	27	2,263	3	20,275	18.3
7	Cleveland, Ohio	127	23	(1)			2.0
8	Pittsburgh, Pa	107	91	6,370	3	6,864	2.0
9	Detroit, Mich	260	46	7,420			3.5
10	Buffalo, N. Y	241	60	6,608			4.2
11	San Francisco, Cal	41	10	1,171	4	8,818	11.8
12	Cincinnati, Ohio	133	4	*8,000*			*0.5*
13	Milwaukee, Wis	79	11	*502*			4.2
14	Newark, N. J	31	48	*2,304*			1.6
15	New Orleans, La	275					(1)
16	Washington, D. C	11	22	1,913	2	8,800	0.5
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.						
17	Minneapolis, Minn	315	17	1,197			
18	Los Angeles, Cal	6					16.3
19	Jersey City, N. J	16	39	2,520	2	11,194	[2] 2.5
20	Kansas City, Mo	108	4	268			7.4
21	Indianapolis, Ind	229					4.0
22	Louisville, Ky	259	9	1,280			*8.7*
23	Seattle, Wash	12	1	50	1	5,016	16.8
24	Providence, R. I		7	1,558	1	5,280	2.5
25	Rochester, N. Y	66	26	1,839			
26	St. Paul, Minn	43	14	(1)	3	2,700	(1)
27	Denver, Colo	742	15	2,890			*6.2*
28	Portland, Oreg	80	1	1,245			4.5
29	Columbus, Ohio	37	10	2,742			1.0
30	Toledo, Ohio	297	23	(1)			1.1
31	Worcester, Mass	24	15	(1)			
32	Atlanta, Ga	19	3	775			
33	Syracuse, N. Y	85	4	(1)	1	106	(1)
34	New Haven, Conn	12	3	120			
35	Scranton, Pa	36	9	540	2	3,520	
36	Paterson, N. J	54	3	200			0.8
37	Omaha, Nebr	129	16	1,050			*2.8*
38	Fall River, Mass	1	6	300	1	106	
39	Memphis, Tenn	146	11	640	9	2,175	4.0
40	Richmond, Va	58	4	5,790	2	4,858	2.0
41	Oakland, Ca	27					7.1
42	Grand Rapids, Mich	88	3	118			1.4
43	Nashville, Tenn	46	12	720			2.0
44	Lowell, Mass	5	3	150			0.3
45	Cambridge, Mass	9	4	(1)			0.3
46	Dayton, Ohio	74	3	235			1.2
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.						
47	Albany, N. Y		11	1,250			2.0
48	Bridgeport, Conn	8	26	1,820			*0.5*
49	Spokane, Wash	70	7	1,875			
50	Hartford, Conn	7	2	90	2	686	0.2
51	Reading, Pa	28	11	400			0.2
52	Trenton, N. J	24	5	300			0.7
53	San Antonio, Tex	105					4.9
54	New Bedford, Mass		9	450			
55	Camden, N. J	91	17	1,020			1.5
56	Dallas, Tex	158	4	*500*			8.3
57	Salt Lake City, Utah	65					25.0
58	Lynn, Mass	14					
59	Wilmington, Del	15	24	1,440			
60	Springfield, Mass	15	7	272			
61	Des Moines, Iowa	170					4.8
62	Lawrence, Mass	12	2	100			1.4
63	St. Joseph, Mo	58	2	70			4.1
64	Troy, N. Y	37	2	60	1	370	0.4
65	Yonkers, N. Y	16	10	1,062			0.4
66	Tacoma, Wash	20	6	600			
67	Youngstown, Ohio	34	10	560			
68	Duluth, Minn	(1)	1	70	1	1,584	
69	Houston, Tex	49	3	(1)			7.8
70	Somerville, Mass	9	1	75			
71	Kansas City, Kans	68					3.3
72	Utica, N. Y	55	2	289			1.8
73	Waterbury, Conn	3	17	*1,020*			
74	Elizabeth, N. J	18	20	1,200			1.0
75	Schenectady, N. Y	2	9	*450*			
76	Hoboken, N. J	2			1	1,320	0.2
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909—Continued.						
77	Manchester, N. H	31	1	50			
78	Evansville, Ind	44					5.4
79	Birmingham, Ala	42	*5*	*760*			*12.0*
80	Akron, Ohio	65	15	*450*			
81	Norfolk, Va	30					2.1
82	Fort Worth, Tex	(1)	7	*2,000*			(1)
83	Wilkes-Barre, Pa	40					
84	Erie, Pa	38	6	410			1.5
85	Savannah, Ga	55	4	200			
86	Peoria, Ill	57					2.2
87	Harrisburg, Pa	8	8	240			*1.0*
88	Fort Wayne, Ind	45	1	30			
89	Charleston, S. C	60					2.0
90	Portland, Me	29	2	150			*2.9*
91	Terre Haute, Ind	*69*					3.8
92	East St. Louis, Ill	*50*					1.0
93	Holyyoke, Mass	6	10	350			1.1
94	Brockton, Mass		10	412			
95	Johnstown, Pa	22	2	*600*			
96	Jacksonville, Fla	76	1	1,000			
97	Oklahoma City, Okla	59					
98	Bayonne, N. J	6	5	300			
99	Covington, Ky	34	8	6,000	1	1,320	1.0
100	South Bend, Ind	82					1.0
101	Passaic, N. J	32	2	60			
102	Altoona, Pa	5	2	147			
103	Mobile, Ala	41					4.0
104	Allentown, Pa	30	1	50			
105	Pawtucket, R. I	16	1	500			
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.						
106	Saginaw, Mich	92					3.7
107	Canton, Ohio	73					
108	Wichita, Kans	181					7.5
109	Springfield, Ill	*105*	3	180			*12.0*
110	Binghamton, N. Y	12	4	320			
111	Lancaster, Pa	20	3	90			
112	Sioux City, Iowa	102	4	290			4.0
113	Little Rock, Ark	12	1	100			0.3
114	Springfield, Ohio	79					1.0
115	Atlantic City, N. J	*68*	1	40			2.0
116	Bay City, Mich						16.0
117	Rockford, Ill	61	2	*78*			1.3
118	York, Pa	22	2	60			0.5
119	Lincoln, Nebr	44					2.5
120	Chattanooga, Tenn	27	1	50			1.5
121	Topeka, Kans	69					3.0
122	Sacramento, Cal	41	1	30			4.4
123	Malden, Mass	12	4	200			
124	Haverhill, Mass	2	4	(1)			
125	Pueblo, Colo	57	3	134			1.5
126	Salem, Mass	11			1	716	
127	New Britain, Conn	15	2	80			
128	Davenport, Iowa	11	17	1,200			1.0
129	McKeesport, Pa	44	1	*1,500*			0.8
130	Wheeling, W. Va	28	5	298			4.9
131	Augusta, Ga	40					3.0
132	Superior, Wis	327					1.5
133	Newton, Mass	3	5	290			
134	Dubuque, Iowa	20					1.4
135	Butte, Mont	26	3	300	2	150	
136	Chester, Pa	*55*	27	1,620			3.0
137	Kalamazoo, Mich	101					
138	Montgomery, Ala	19					1.3
139	Woonsocket, R. I	10	6	260			
140	Galveston, Tex	39					14.0
141	Fitchburg, Mass	3	2	250			
142	Racine, Wis	31	2	60			
143	Elmira, N. Y	27	2	65			0.5
144	Quincy, Ill	*41*	3	210			2.5
145	Knoxville, Tenn	44	7	582			*1.0*
146	New Castle, Pa	40	2	120			
147	Macon, Ga	23	10	*600*			0.5
148	Auburn, N. Y	28					
149	West Hoboken, N. J	1			1	1,954	(3)
150	Joliet, Ill	(1)			(1)		(1)
151	Taunton, Mass	34	3	120			
152	Everett, Mass	1					
153	Oshkosh, Wis	59					2.8
154	Chelsea, Mass	8					
155	Joplin, Mo	149					0.5
156	La Crosse, Wis	72	3	180			*2.0*
157	Newport, Ky	9	1	*5,776*			*2.0*
158	South Omaha, Nebr	10	5	400			

---

[1] Not reported.

[2] Includes 1.5 miles of Pennsylvania elevated tracks.

[3] Less than one-tenth of 1 mile.

Subways and tunnels for street cars.—The information secured with reference to street car subways and tunnels that were owned by the city is as follows:

City number.	CITY.	Mileage of subways and tunnels.	Mileage of single track.	Number of stations.	Total cost of construction.	Total bonded indebtedness at close of year.
	Total	29.88	72.92	71	$67,024,576	$65,066,222
1	New York, N. Y	25.63	63.02	59	51,924,576	49,966,222
5	Boston, Mass	4.20	9.90	12	15,100,000	15,100,000
138	Montgomery, Ala	0.05	(1)	(1)	(1)	(1)

(1) Not reported.

The number of stations reported above does not necessarily include the number of station platforms, but the number of stations at different points on the car lines where the cars stop.

Conduits owned by city.—The length of conduits under the streets and alleys for wires owned by the city is as follows:

City number.	CITY.	Total mileage.	Mileage used exclusively by city.
6	Baltimore, Md	1,541.00	19.70
9	Detroit, Mich	120.75	120.75
13	Milwaukee, Wis	109.20	109.20
2	Chicago, Ill	99.46	98.74
3	Philadelphia, Pa	94.40	....
23	Seattle, Wash	65.60	64.30
1	New York, N. Y	63.18	63.18
5	Boston, Mass	59.00	59.00
84	Erie, Pa	44.60	....
16	Washington, D. C	19.46	19.46
128	Davenport, Iowa	17.02	6.00
61	Des Moines, Iowa	14.75	5.00
11	San Francisco, Cal	12.90	1.00
7	Cleveland, Ohio	8.20	8.20
42	Grand Rapids, Mich	5.83	2.16
38	Fall River, Mass	4.00	4.00
146	New Castle, Pa	3.50	1.00
10	Buffalo, N. Y	3.37	3.37
17	Minneapolis, Minn	3.30	3.30
148	Auburn, N. Y	3.16	....
90	Portland, Me	2.50	2.50
28	Portland, Oreg	1.60	1.60
127	New Britain, Conn	1.50	....
72	Utica, N. Y	1.00	....
126	Salem, Mass	1.00	....
63	St. Joseph, Mo	.62	....
4	St. Louis, Mo	.60	.60
8	Pittsburgh, Pa	.20	.20
41	Oakland, Cal	.20	.20
111	Lancaster, Pa	.20	....
125	Pueblo, Colo	.06	.06

Street lighting.—In Table 32 are shown the total payments for street lighting in each of the cities covered by this investigation during the year 1909, and the cost of lighting per 1,000 square yards of improved streets and per capita. There are also shown the number of each kind of lamps, the cost per lamp per year, and the schedule number of hours the lamps were lighted during the year. The number of lights shown is in general exclusive of those in park areas. In a few of the larger cities, however, where the parking and boulevard systems have independent lighting equipments, the lights of the boulevards were considered as forming a part of the street-lighting system.

The rate per light per year is governed largely by local conditions under which or according to which the lighting is done. In some instances, the lighting companies install a specified style of supports for the lamps, or place their wires under ground or perform some particular service which affects the yearly rate charged to the city. Furthermore, the city sometimes pays the expense of lighting the lamps, and in other cities this expense is borne by the companies furnishing the lights. The yearly rates per light are, however, of interest regardless of the differences in the extent and character of the lighting service. In using the yearly rates for lights as a basis for comparison between the payments of one city with those of another, it would be well to know the rates paid by private consumers in these cities. It is possible that in some of the cities enjoying low rates for street lighting more than the average rate is charged for private lighting, the lighting company allowing a low rate for street lighting as a partial compensation for its franchise, and private consumers being charged a rate higher than would otherwise prevail. Therefore a knowledge of the rates charged private consumers is essential to an exact statement of the relative rates paid for the lighting service of the different cities.

Some cities have a system of lighting the business districts which is particularly effective, and the credit for which is usually due to the local merchants who realize certain personal advantages from the plan in addition to its municipal benefits. This system arranges clusters of three or four inclosed incandescent electric lights upon heavy pedestals 8 to 10 feet in height, three or four to the block on each side of the street in the business section of the city. The first city to install this system was Los Angeles, Cal.; since then, several other cities have adopted it.

The candlepower of an electric light depends not upon the amperage, but upon the number of watts of electricity consumed per hour; in this investigation, however, only the amperage of the lights was obtained.

The number of cities in each of the four groups into which the 158 cities are arranged according to population, which in 1909 had lights of the kind indicated, was as follows:

GROUPS OF CITIES.	COMBUSTION LIGHTS.			ELECTRIC LIGHTS.		
	Flat flame.	Welsbach.	Vapor and oil.	Open arc.	Inclosed arc.	Incandescent.
Total	20	52	28	32	137	93
Group I	6	12	8	5	15	9
Group II	6	14	7	7	26	17
Group III	5	20	7	11	50	40
Group IV	3	6	6	9	46	27

The following statement shows the number of cities using each specified style of lighting in 1909 and 1907, respectively:

KIND OF LIGHT.	NUMBER OF CITIES.	
	1909	1907
Flat flame	20	21
Welsbach	52	51
Vapor and oil	28	35
Open arc	32	45
Inclosed arc	137	125
Incandescent	93	76

The statement here given indicates an increase in the general use of incandescent and inclosed arc lights. All of the cities reported either open or inclosed arc lights in both 1907 and 1909, but the relative number of cities using inclosed arc lights was considerably larger in the latter year. There was a very marked increase in the number of cities using incandescent lights for street lighting and in the number of these lights used. The latter fact is brought out by the following table, which gives the total number of lights of each kind reported in both 1907 and 1909:

KIND OF LIGHT.	NUMBER OF LIGHTS.		Per cent of increase.
	1909	1907	
Flat flame	34,895	40,549	[1] 13.9
Welsbach	173,507	163,309	6.2
Vapor and oil	38,731	45,618	[1] 15.1
Open arc	38,726	44,760	[1] 13.4
Inclosed arc	134,544	110,033	22.3
Incandescent	81,605	48,044	69.9

[1] Decrease.

Docks and wharves.—In connection with the collection of other data for highway statistics, census agents were instructed to report those relating to docks and wharves used by the city. A total of 14 cities reported the possession of such docks and wharves as follows. The figures in italics are estimates:

City number.	CITY.	DOCKS AND WHARVES.		Total space (square feet) on wharves.
		Total number.	Frontage (feet).	
	Total	21	9,576	1,252,924
103	Mobile, Ala	1	2,400	471,375
5	Boston, Mass	5	1,850	387,279
39	Memphis, Tenn	(1)	2,000	*100,000*
157	Newport, Ky	1	*1,000*	*100,000*
48	Bridgeport, Conn	1	140	56,000
66	Tacoma, Wash	2	170	31,800
23	Seattle, Wash	2	100	31,380
16	Washington, D. C	3	279	24,500
131	Augusta, Ga	1	300	23,000
68	Duluth, Minn	1	462	*9,240*
130	Wheeling, W. Va	1	600	*9,000*
85	Savannah, Ga	1	96	*4,750*
84	Erie, Pa	1	*100*	*3,000*
128	Davenport, Iowa	1	80	*1,600*

(1) Not reported.

The number of warehouses and square feet of floor space in warehouses on the wharves given above was as follows:

City number.	CITY.	Number of warehouses.	Area (square feet) of floor space.
	Total	9	98,865
103	Mobile, Ala	4	51,375
85	Savannah, Ga	2	22,500
23	Seattle, Wash	1	20,000
66	Tacoma, Wash	1	4,750
131	Augusta, Ga	1	240

PART VI.—STATISTICS OF SALARIES AND WAGES

Contents of Table 33.—General Table 33 is arranged to present in a condensed form all facts ascertained by the agents of the Bureau of the Census concerning the salaries and wages of city employees engaged in the sewage-disposal service, the refuse-disposal service, the street-cleaning service, the dust-prevention service, and the general highway service.

Salaries of the highest paid officials.—Attention has been called in the Introduction to this report to the fact that the construction, maintenance, and care of sewers and highways, including street cleaning and dust prevention, are very commonly under a common supervision, which in about one-half of the cities also extends over the collection and disposal of refuse. Under such circumstances the engineer or other official in charge of sewers may also have charge of highway construction and maintenance, and also of the refuse-disposal, street-cleaning, and dust-prevention services; in such a case one individual is the highest paid official in two or more of the five services for which Table 33 presents statistics of salaries and wages. In cases of this kind the salary of such officer, instead of being divided among the different services of which he is in charge, is assigned to the service claiming the greater part of his attention. It is believed, however, that there is a fair degree of comparability between the highest salaries reported as paid in the three other services in the several cities.

What has been said relative to the comparability of the salaries reported as paid to the highest salaried officers in the several services is also true, although to a somewhat less degree, in the case of the second highest paid officials.

The average salary of the highest paid officials in the general highway service was $2,644 per annum, or higher than for any other service. In the sewer service the corresponding average was $2,497; in street cleaning, $1,673; in refuse disposal, $1,504; and in dust prevention, $1,350. A convenient summary of the average salaries of the highest paid officials of each service in the several geographic divisions is here presented for 1909:

GEOGRAPHIC DIVISION.	AVERAGE SALARY OF HIGHEST PAID EMPLOYEE IN—				
	Sewer service.	Refuse-disposal service.	Street-cleaning service.	Dust-prevention service.	General highway service.
United States	$2,497	$1,504	$1,673	$1,350	$2,644
North Atlantic	2,840	1,648	1,962	(1)	2,594
South Atlantic	2,547	1,754	1,775	1,200	2,782
North Central	2,215	1,292	1,497	1,040	2,662
South Central	2,323	1,460	1,394	1,440	2,266
Western	2,190	1,568	2,066	1,800	3,298

[1] Not reported.

It is to be noted that while the cities in the Western division, according to this table, pay the highest, and the cities of the South Central division the lowest salaries to the heads of the general highway service, the cities of the Western division pay the lowest, and the cities of the North Atlantic division pay the highest salaries to the heads of the sewer service. It must not be thought, however, that the table furnishes a perfect index of the relative salaries paid in cities of the various geographic divisions to officials in charge of the services under discussion. The average salary reported as paid by cities in any division is necessarily affected by the prevailing method of governmental organization in that division. Thus the salaries paid in a given service in two divisions may differ widely as a result of the fact that in one division the service in question is ordinarily organized as an independent department; while in the other it is commonly a subordinate branch of another service. Without knowledge of these factors of organization, which can not be here presented, an intelligent comparison of different divisions is impossible.

There was great variation in the salaries paid to the highest-paid officials of the sewer service, even in the same section, as is shown by the fact that the salaries ranged from $720 per annum in York, Pa., to $8,000 in Philadelphia, Pa. It should be noted, however, that in almost all instances where the official in charge drew a salary of $1,200 or less per year, such official is a subordinate of some higher-paid official in another department, the sewer service being in these cases merely a subordinate branch of some larger department of city service.

The lower average salary paid to the official in charge of the refuse-disposal service is explained in large part by the fact that an officer in immediate charge of refuse disposal is generally under the direction of a higher-salaried official, the refuse-disposal service being in but comparatively few instances an independent division of government. In about one-half of the cities the service is under the supervision of the health department, and in the other half it is under the supervision of the highway department. The average salary paid to officials in immediate charge of the refuse-disposal service was $1,504. The highest average salary was paid by the cities of the South Atlantic division, and the lowest by the cities of the North Central division. The highest salary paid by an individual city was $7,000 per year by New York, N. Y., and the lowest was $600 per year, paid by Reading, Pa. Nine cities reported a salary of $2,400 and over; 2 cities paid a salary of $2,000;

46 cities paid from $1,000 to $2,000; 7 cities paid $720 per year or less.

The average salary paid to the officials in immediate charge of street cleaning was $1,673. The highest salaries for this position were paid by the cities of the Western division, and the lowest by those of the South Central division. As in the case of the refuse-disposal service, the average salary paid in the street-cleaning service was unusually low when compared with that in the sewer and highway services. The highest annual salary for the official in charge of this service was $4,700, paid by the city of New York, and the lowest, $800, was paid by the city of York, Pa. Six cities, including New York, paid annual salaries of over $3,000; 10 cities paid salaries ranging from $2,000 to $3,000; 51 cities paid salaries ranging from $1,000 to $2,000; while 5 cities paid salaries of $1,000 or less.

The average salary paid to the official in charge of the dust-prevention service was less than that of any of the other services under discussion. The highest average salaries were paid by the cities of the Western division, and the lowest by the cities of the North Central division. Only 8 cities reported the salaries paid to the officials in immediate charge of the dust-prevention service. This is explained as in the case of the refuse-disposal and street-cleaning services by the fact that the official in direct charge was generally also the head of some other and more important department of city service. In this connection it is also interesting to note that but 8 cities reported the payment of a salary of $900 or over for the second highest-paid official in the dust-prevention service.

The averages of the salaries paid to officials in charge of the general highway service were higher than in any of the other services covered by this investigation. The cities of the Western division paid the highest average salary, and those of the South Central division the lowest. The highest salary paid the official in charge of the general highway service was $7,500, paid by the city of Seattle, Wash., while 6 other cities paid a salary of $5,000. The lowest salary was $900, paid by the city of York, Pa. Sixteen cities paid from $3,000 to $4,000; 35 cities, from $2,000 to $3,000; 23 cities, from $1,500 to $2,000; and 6 cities, including York, Pa., paid $1,500 or less.

Salaries of foremen and inspectors.—The annual and daily salaries paid have been tabulated separately for all cities and for all averages. The averages of those salaries are presented by geographic divisions for all of the five services covered by this report in the following table:

GEOGRAPHIC DIVISION.	AVERAGE SALARY OF FOREMEN AND INSPECTORS.									
	Sewer service.		Refuse-disposal service.		Street-cleaning service.		Dust-prevention service.		General highway service.	
	Annual.	Daily.	Annual.	Daily.	Annual.	Daily.	Annual.	Daily.	Annual.	Daily.
United States......	$988	$3.10	$913	$2.89	$912	$2.76	$972	$2.76	$953	$2.95
North Atlantic..........	1,042	3.04	943	3.20	944	2.93	1,040	2.71	944	2.94
South Atlantic..........	913	3.08	913	2.00	811	3.42	858	.....	888	2.73
North Central..........	925	3.08	845	2.84	856	2.54	900	2.50	1,008	2.86
South Central..........	922	2.92	877	2.75	853	2.62	750	.....	866	2.82
Western..................	1,164	5.00	1,063	.....	1,196	3.20	1,200	3.30	1,149	3.52

The average annual salary paid to foremen and inspectors was highest in the sewer service, being $988 per annum as against $972 in the dust-prevention service, $953 in the general highway service, $913 in the refuse-disposal service, and $912 in the street-cleaning service. The highest average salary for any service paid by the cities of any division was $5 per day, paid by the cities of the Western division to foremen and inspectors of sewers. The lowest average salary paid to these employees was in the refuse-disposal service of cities of the South Atlantic division, where the salary paid was only $2 per day. It will be noted that in every class of service the highest average annual salary was paid by the cities of the Western division. The lowest salaries in the sewer and street-cleaning services were paid by the cities of the South Atlantic division; the lowest in the refuse-disposal service by the cities of the North Central; and the lowest in the dust-prevention service and the general highway service in the South Central division. The highest salary paid in the sewer service was $1,800, paid by Syracuse, N. Y., and the lowest, $2 per day, paid by several cities. In the refuse-disposal service the highest salary paid was $4.50 per day, paid by Yonkers, N. Y., and the lowest, $260 per year, reported by Portland, Me. In the street-cleaning service the salaries ranged from $1,640 per annum, paid by San Francisco, Cal., to $600 per annum, reported by Troy, N. Y., Augusta, Ga., and Dubuque, Iowa. The highest salary paid in the dust-prevention service was $1,200, paid by the cities of Los Angeles, Cal., Denver, Colo., Oakland, Cal., and Cambridge and Springfield, Mass., while the lowest was $2 per day reported by Everett, Mass. In the general highway service the highest salary reported was $1,800 per year, paid by Chicago, Ill., and the lowest, $450 per year, paid by Newton, Mass.

Wages of mechanics and skilled laborers.—The average wages of mechanics and skilled laborers were higher in the sewer service than in either the general highway or the street-cleaning service. The averages of wages for the three services mentioned are given by geographic division in the text table which follows.

GEOGRAPHIC DIVISION.	AVERAGE DAILY WAGES OF MECHANICS AND SKILLED LABORERS.		
	Sewer service.	Street-cleaning service.	General highway service.
United States	$3.32	$2.87	$3.11
North Atlantic	3.42	2.84	3.19
South Atlantic	3.10	2.09	2.74
North Central	3.34	2.70	3.09
South Central	2.52	2.77	2.72
Western	4.43	3.62	3.74

The average daily wages paid to mechanics and skilled laborers in all of the three services for which figures are given in the foregoing table were highest in the cities of the Western division, and second highest in those of the North Atlantic division. They were lowest for the sewer and general highway services in the cities of the South Central division, and lowest for the street-cleaning service in those of the South Atlantic division. The highest wages reported as paid to this class of employees were $6 per day in San Francisco, Cal., and the lowest, $1.67 per day, paid by Little Rock, Ark. In the street-cleaning service the highest wages reported were $5 per day, paid by Butte, Mont., and Seattle, Wash.; while in the general highway service the highest were $5.50 per day in Harrisburg, Pa., and the lowest, $1.75 per day, in Knoxville, Tenn.

Wages of teamsters.—In the table which follows are given by geographic divisions the average wages of teamsters in the five services covered by this report.

GEOGRAPHIC DIVISION.	AVERAGE DAILY WAGES OF TEAMSTERS IN—				
	Sewer service.	Refuse-disposal service.	Street-cleaning service.	Dust-prevention service.	General highway service.
United States	$2.03	$1.95	$1.96	$2.00	$1.98
North Atlantic	2.05	2.08	2.03	2.03	2.05
South Atlantic	1.75	1.48	1.54	1.55	1.55
North Central	1.97	1.96	1.90	1.98	1.94
South Central	1.75	1.70	1.72	1.73	1.67
Western	2.68	2.75	2.60	2.62	2.61

In each of the five branches of service the highest average was that of the cities of the Western division, and the second highest, that of the cities of the North Atlantic division. The lowest wages for each service were paid in the South Atlantic division with the exception of the sewer service, in which the wages reported were the same as in the South Central division. The highest wages paid to teamsters by any city were $3.50 per day. This amount was paid by Butte, Mont., in each of the services; but in the street-cleaning, dust-prevention, and general highway service the same wages were paid by Trenton, N. J., and in the refuse-disposal service, by Columbus, Ohio, and Oakland, Cal. The lowest wages paid in each of the services with the exception of dust prevention were paid by Montgomery, Ala., and in the street-cleaning service, by Augusta, Ga. In the dust-prevention service the lowest wages paid ($1.25 per day) were reported by several cities in the South Atlantic and South Central divisions.

Wages of unskilled laborers.—In the table which follows are given by geographic divisions the average wages of unskilled laborers in the five services covered by this report:

GEOGRAPHIC DIVISION.	AVERAGE WAGES OF UNSKILLED LABORERS IN—				
	Sewer service.	Refuse-disposal service.	Street-cleaning service.	Dust-prevention service.	General highway service.
United States	$1.94	$1.89	$1.84	$2.15	$1.88
North Atlantic	1.94	1.98	1.86	1.84	1.90
South Atlantic	1.65	1.50	1.53	....	1.53
North Central	1.89	1.83	1.79	1.75	1.81
South Central	1.72	1.70	1.69	1.75	1.68
Western	2.73	2.59	2.50	2.83	2.54

In the case of unskilled laborers, as in the case of mechanics, skilled laborers, and teamsters, the highest average wages paid in each of these services, so far as reported, were paid by the cities of the Western division, and the second highest, by those of the North Atlantic division. The lowest average wages in four of the services were paid by the cities of the South Atlantic division, and in that division no report of wages paid was received for the dust-prevention service. The highest wages paid for labor in the sewer service were $4 per day reported by San Francisco, Cal. In each of the other services the highest wages were $3.50 per day paid in each case by Butte, Mont. The lowest wages was $1 per day, paid by Montgomery, Ala., in all the services except that of dust prevention, by Little Rock, Ark., in the refuse-disposal service, and by Troy, N. Y., in the street-cleaning service. In the dust-prevention service the lowest wages ($1.50 per day) were paid by Waterbury, Conn.

LIST OF CITY NUMBERS.

Throughout the general tables of this report the cities are arranged and numbered according to the estimated population on June 1, 1909. For convenience in finding any particular city, the following list has been prepared, the cities being arranged alphabetically, by states and territories, and the city number assigned to each being indicated.

CITY AND STATE.	City number.
Alabama:	
Birmingham	79
Mobile	103
Montgomery	138
Arkansas:	
Little Rock	113
California:	
Los Angeles	18
Oakland	41
Sacramento	122
San Francisco	11
Colorado:	
Denver	27
Pueblo	125
Connecticut:	
Bridgeport	48
Hartford	50
New Britain	127
New Haven	34
Waterbury	73
Delaware:	
Wilmington	59
District of Columbia:	
Washington	16
Florida:	
Jacksonville	96
Georgia:	
Atlanta	32
Augusta	131
Macon	147
Savannah	85
Illinois:	
Chicago	2
East St. Louis	92
Joliet	150
Peoria	86
Quincy	144
Rockford	117
Springfield	109
Indiana:	
Evansville	78
Fort Wayne	88
Indianapolis	21
South Bend	100
Terre Haute	91
Iowa:	
Davenport	128
Des Moines	61
Dubuque	134
Sioux City	112
Kansas:	
Kansas City	71
Topeka	121
Wichita	108
Kentucky:	
Covington	99
Louisville	22
Newport	157
Louisiana:	
New Orleans	15
Maine:	
Portland	90
Maryland:	
Baltimore	6
Massachusetts:	
Boston	5
Brockton	94
Cambridge	45
Chelsea	154
Everett	152
Fall River	38
Fitchburg	141
Haverhill	124
Holyoke	93
Lawrence	62
Lowell	44
Lynn	58
Malden	123
New Bedford	54
Newton	133
Salem	126
Somerville	70
Springfield	60
Taunton	151
Worcester	31
Michigan:	
Bay City	116
Detroit	9
Grand Rapids	42
Kalamazoo	137
Saginaw	106
Minnesota:	
Duluth	68
Minneapolis	17
St. Paul	26
Missouri:	
Joplin	155
Kansas City	20
St. Joseph	63
St. Louis	4
Montana:	
Butte	135
Nebraska:	
Lincoln	119
Omaha	37
South Omaha	158
New Hampshire:	
Manchester	77
New Jersey:	
Atlantic City	115
Bayonne	98
Camden	55
Elizabeth	74
Hoboken	76
Jersey City	19
Newark	14
Passaic	101
Paterson	36
Trenton	52
West Hoboken	149
New York:	
Albany	47
Auburn	148
Binghamton	110
Buffalo	10
Elmira	143
New York	1
Rochester	25
Schenectady	75
Syracuse	33
Troy	64
Utica	72
Yonkers	65
Ohio:	
Akron	80
Canton	107
Cincinnati	12
Cleveland	7
Columbus	29
Dayton	46
Springfield	114
Toledo	30
Youngstown	67
Oklahoma:	
Oklahoma City	97
Oregon:	
Portland	28
Pennsylvania:	
Allentown	104
Altoona	102
Pennsylvania—Contd.	
Chester	136
Erie	84
Harrisburg	87
Johnstown	95
Lancaster	111
McKeesport	129
New Castle	146
Philadelphia	3
Pittsburgh	8
Reading	51
Scranton	35
Wilkes-Barre	83
York	118
Rhode Island:	
Pawtucket	105
Providence	24
Woonsocket	139
South Carolina:	
Charleston	89
Tennessee:	
Chattanooga	120
Knoxville	145
Memphis	39
Nashville	43
Texas:	
Dallas	56
Fort Worth	82
Galveston	140
Houston	69
San Antonio	53
Utah:	
Salt Lake City	57
Virginia:	
Norfolk	81
Richmond	40
Washington:	
Seattle	23
Spokane	49
Tacoma	66
West Virginia:	
Wheeling	130
Wisconsin:	
La Crosse	156
Milwaukee	13
Oshkosh	153
Racine	142
Superior	132

GENERAL TABLES

TABLE 1.—SEWERS—GENERAL STATISTICS

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see

City number.	CITY.	POPULATION.		Area (acres) served by sewer system (estimate).	MILEAGE OF SEWERS.								
		Total.	Served by sewer system (estimate).		Total.	Classified by character.			Classified by construction material.				
						Sanitary.	Combined.	Storm-water.	Stone.	Brick.	Brick and concrete.	Brick and stone.	Concrete.
	Grand total	25,603,949	20,593,303	1,055,211	24,971.9	5,258.3	18,361.5	1,352.1	129.9	6,295.4	220.5	96.2	217.6
	Group I	14,241,954	12,159,198	442,377	10,973.7	789.5	9,834.3	349.9	10.8	4,063.5	76.6	25.8	61.7
	Group II	5,043,984	3,891,153	260,932	6,094.4	1,404.4	4,405.8	284.2	93.9	1,181.3	57.9	41.5	65.5
	Group III	4,206,680	3,112,712	217,064	4,831.2	1,831.5	2,615.5	384.2	5.4	736.0	17.7	26.8	48.0
	Group IV	2,111,331	1,430,240	134,838	3,072.6	1,232.9	1,505.9	333.8	19.8	314.6	68.3	2.1	42.4
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.												
1	New York, N. Y	4,629,310	4,283,397	48,675	1,907.9	146.8	1,738.7	22.4		617.7	23.5		9.3
	Bronx Borough	(2)	400,000	6,400	283.3	35.5	247.8			56.4			7.7
	Brooklyn Borough	(2)	1,400,000	23,000	830.3	0.4	817.5	12.4		154.3			1.6
	Manhattan Borough	(2)	2,283,397	12,000	523.3		523.3			404.2			
	Queens Borough	(2)	150,000	4,275	196.0	46.1	139.9	10.0			23.5		
	Richmond Borough	(2)	50,000	3,000	75.0	64.8	10.2			2.8			
2	Chicago, Ill	2,142,156	1,750,000	90,000	1,837.0	6.5	1,822.9	7.6		624.5			15.0
3	Philadelphia, Pa	1,526,386	1,400,000	55,288	1,185.1	97.1	990.9	97.1		1,087.0		8.5	
4	St. Louis, Mo	677,123	585,000	22,200	649.0		649.0		0.8	257.9	3.1	10.8	
5	Boston, Mass	657,312	655,000	24,613	765.6	82.1	588.3	95.2		91.4			
6	Baltimore, Md	554,095	(2)	(2)	77.4		77.4		6.2	29.4	5.3		4.3
7	Cleveland, Ohio	538,374	526,353	25,749	529.2	19.1	491.0	19.1	0.3	292.9	1.8		
8	Pittsburgh, Pa	527,694	500,000	23,500	542.2	4.0	538.2		0.4	78.7			0.6
9	Detroit, Mich	447,484	444,768	25,272	631.6		631.6			392.3	0.4		
10	Buffalo, N. Y	415,314	380,700	20,480	507.0		507.0		1.6	163.0		4.0	0.9
11	San Francisco, Cal	410,343	330,000	18,000	358.9	2.7	353.1	3.1		112.7	6.8		
12	Cincinnati, Ohio	360,454	293,520	19,000	326.0		326.0		2.0	68.2			
13	Milwaukee, Wis	359,060	350,000	14,000	419.4		419.4			[5] 123.8			
14	Newark, N. J	335,949	260,460	10,600	269.0	58.9	204.1	6.0	(7)	71.9	1.5		0.2
15	New Orleans, La	334,470	100,000	25,000	425.0	325.6		99.4		6.4			3.3
16	Washington, D. C	326,430	300,000	20,000	543.4	46.7	496.7			45.7	40.2	3.0	28.1
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.												
17	Minneapolis, Minn	294,330	147,000	11,369	257.4	6.5	250.9			104.7			
18	Los Angeles, Cal	290,868	205,000	14,600	439.0	418.6		20.4		26.3			6.7
19	Jersey City, N. J	261,482	220,000	6,656	126.5		122.5	4.0		71.7			
20	Kansas City, Mo	241,767	212,500	14,251	354.5		349.5	5.0	2.8	76.3			1.6
21	Indianapolis, Ind	228,690	225,000	16,081	257.3	13.0	239.1	5.2		80.5			11.6
22	Louisville, Ky	222,293	130,000	10,948	152.3		152.3			59.4			
23	Seattle, Wash	221,491	150,000	7,500	247.2		247.2			14.1	1.5		
24	Providence, R. I	219,715	194,000	8,000	228.6		217.8	10.8		76.3			1.0
25	Rochester, N. Y	211,664	210,000	11,384	266.0		265.8	0.2	74.0	25.7			
26	St. Paul, Minn	211,563	85,000	4,480	281.4	12.1	267.7	1.6				33.6	5.6
27	Denver, Colo	207,112	150,000	37,920	429.3	334.0	3.6	91.7		35.0			
28	Portland, Oreg	190,017	175,000	8,000	189.0		189.0			12.5		7.0	
29	Columbus, Ohio	168,350	150,000	8,960	207.3	19.6	187.5	0.2		77.5	6.5		
30	Toledo, Ohio	165,247	150,000	12,800	231.4		231.4			148.0			3.7
31	Worcester, Mass	142,835	126,500	4,832	192.3	81.8	64.8	45.7	3.3	42.9			
32	Atlanta, Ga	135,916	80,000	3,840	161.2		161.2			19.2			0.5
33	Syracuse, N. Y	133,728	121,000	8,312	164.8	12.6	152.2			36.3			0.9
34	New Haven, Conn	131,337	100,000	3,570	116.0		116.0			42.3			0.1
35	Scranton, Pa	127,508	85,000	3,559	110.9		110.9		1.0	6.6			
36	Paterson, N. J	123,075	96,000	2,500	84.6	2.0	82.6			21.3			
37	Omaha, Nebr	122,187	100,000	7,680	182.4	51.8	130.6			22.7			0.9
38	Fall River, Mass	116,906	83,020	5,231	71.4		71.4		0.9	20.9		0.6	
39	Memphis, Tenn	116,706	102,021	10,754	277.2	277.2				1.4			
40	Richmond, Va	116,053	96,000	2,818	106.8	1.0	105.8		6.6	60.5		0.3	0.2
41	Oakland, Cal	115,459	105,562	8,000	239.0	9.7	225.4	3.9		4.8			7.1
42	Grand Rapids, Mich	110,060	80,000	6,624	178.5	16.4	147.7	14.4		21.7			10.4
43	Nashville, Tenn	109,619	70,000	4,480	98.5		98.5		3.4	27.3			0.8
44	Lowell, Mass	104,148	95,000	6,400	105.5	1.2	102.3	2.0	1.2	32.1			
45	Cambridge, Mass	103,531	97,000	3,840	140.6	23.7	110.6	6.3			49.0		0.2
46	Dayton, Ohio	100,327	50,550	5,543	197.5	123.2	1.5	72.8	0.7	13.3	0.9		14.2

---

[1] Includes expenses of pumping and purification.
[2] Not reported.
[3] Includes expenses of pumping.
[4] Includes cost of pumping station only.
[5] Includes mileage of concrete sewers.
[6] Includes mileage of cement pipe sewers.

OF SEWER SYSTEMS: 1909.

page 85. For a text discussion of this table, see page 20. Figures printed in italics are estimates.]

MILEAGE OF SEWERS—continued.				NUMBER OF MANHOLES.		NUMBER OF CATCH BASINS.		Number of inverted siphons.	Number of storm-water overflows.	Number of outlets.	Cost, or replacement value, of system.	EXPENSES OF OPERATION AND MAINTENANCE.			City number.
Classified by construction material—Continued.				Total.	Per mile of sewer.	Total.	Per mile of sewer.					Total.	Per 1,000 population served.	Per mile of sewer.	
Reinforced concrete.	Vitrified pipe.	Cement pipe.	All other.												
101.6	16,844.0	865.3	201.9	502,569	20.1	390,253	15.6	214	771	3,455	$351,091.519	$6,093,897	$290.90	$243,065	
37.6	6,106.6	489.6	101.5	305,129	27.7	211,941	19.2	54	189	1,389	189,338,200	4,130,377	332.22	377.63	
34.8	4,430.5	137.5	51.5	101,250	16.6	82,510	13.5	45	271	488	86,978,089	897,506	230.65	147.27	
15.7	3,796.9	141.9	42.8	58,113	12.0	56,048	11.6	59	186	699	50,301,751	699,605	220.82	144.81	
13.0	2,510.0	96.3	6.1	38,077	12.4	39,754	12.9	56	125	879	24,473,479	366,409	253.51	119.25	
GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.															
15.5	771.2	469.3	1.4	85,868	45.0	22,483	11.8	13	47	343	$51,075,714	[1] $1,410,173	$329.22	$739.14	1
....	219.2	....	....	11,904	42.0	3,625	12.8	2	3	15	(2)	(2)	(2)	(2)	
5.3	213.2	454.5	1.4	*41,200*	49.6	10,323	12.4	8	20	62	(2)	(2)	(2)	(2)	
....	119.1	....	....	*26,167*	50.0	6,348	12.1	....	13	172	(2)	(2)	(2)	(2)	
5.0	152.7	14.8	....	5,400	27.6	1,496	7.6	2	....	38	(2)	(2)	(2)	(2)	
5.2	67.0	....	....	1,197	16.0	691	9.2	1	11	56	(2)	(2)	(2)	(2)	
....	1,197.5	....	....	68,381	37.2	73,843	40.2	2	....	150	60,042,650	[3] 796,701	455.26	433.70	2
1.8	87.8	....	....	33,826	28.5	37,743	31.8	2	(2)	*150*	....	163,580	116.84	138.03	3
0.6	369.3	7.5	....	*13,098*	20.2	13,508	20.8	....	4	75	....	198,472	339.27	305.81	4
....	647.5	....	26.7	(2)	....	*17,500*	22.9	(2)	(2)	3	[4] 133,800	[3] 374,383	571.58	488.97	5
1.2	27.4	....	3.6	(2)	....	(2)	....	1	....	92	8,714,090	90,836	....	1,174.20	6
12.1	182.1	0.2	39.8	*8,997*	17.0	*14,754*	27.9	5	50	24	13,945,545	64,074	121.73	121.07	7
....	462.5	....	....	9,214	17.0	*5,400*	10.0	....	4	152	8,056,668	50,245	100.49	92.67	8
1.0	237.9	....	....	8,330	13.2	(2)	....	....	....	76	7,687,572	[3] 55,902	125.69	88.51	9
....	335.9	....	1.6	10,718	21.1	4,700	9.3	11	13	35	7,303,935	[3] 49,848	130.94	98.33	10
1.9	229.4	11.0	3.1	*10,000*	27.9	(2)	....	2	....	120	4,415,039	[3] 257,007	778.81	716.16	11
....	255.8	....	....	12,631	38.7	5,267	16.2	....	....	64	7,150,000	66,295	225.86	203.33	12
....	[6] 295.6	....	....	20,385	48.6	8,889	21.2	3	6	82	6,525,000	[3] 142,294	406.55	339.31	13
2.0	191.8	1.6	....	7,674	28.5	3,407	12.7	2	8	17	4,916,126	[3] 112,688	432.65	418.88	14
....	390.9	....	24.4	4,607	9.9	(2)	....	8	*12*	3	[8] 9,372,751	[3] 121,463	1,214.63	285.80	15
1.5	424.0	....	0.9	11,400	21.0	4,447	8.2	5	45	3	....	[3] 176,416	588.05	324.66	16
GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.															
7.1	106.9	32.4	6.3	9,162	35.6	6,353	24.7	....	8	13	$6,593,525	$59,110	$402.11	$229.64	17
....	397.5	8.2	0.3	*5,000*	11.4	*450*	1.0	....	....	1	2,549,044	28,246	137.79	64.34	18
....	47.8	....	7.0	*3,278*	25.9	2,800	22.1	5	(2)	12	....	42,288	192.22	334.40	19
0.1	272.8	0.9	....	6,391	18.0	4,575	12.9	....	26	29	5,300,000	[9] 683	3.21	1.93	20
....	158.2	7.0	....	4,112	16.0	5,287	20.5	....	36	42	3,846,592	39,901	177.34	155.08	21
18.0	74.9	....	....	*920*	6.0	*5,000*	32.8	4	....	17	5,250,000	22,193	170.72	145.68	22
3.4	228.2	....	....	4,183	16.9	5,269	21.3	....	2	45	3,821,984	26,433	176.22	106.91	23
....	151.3	....	....	9,434	41.3	5,130	22.4	2	51	1	8,564,424	[1] 131,591	678.30	575.74	24
....	166.1	....	0.2	*3,000*	11.3	....	....	....	13	8	3,630,069	19,285	91.83	72.50	25
....	198.9	16.9	26.4	5,635	20.0	5,914	21.0	....	4	10	2,775,000	[1] 31,331	368.60	111.34	26
....	394.3	....	....	(2)	....	(2)	....	....	....	5	3,846,725	25,229	168.19	58.77	27
....	169.3	....	0.2	*3,788*	20.0	*4,140*	21.9	....	....	48	....	[10] 36,673	209.56	194.01	28
....	123.3	....	....	3,628	17.5	3,022	14.6	....	26	5	4,788,309	[1] 50,735	338.23	244.69	29
....	79.6	....	0.1	*4,072*	17.6	(2)	....	....	....	(2)	2,770,000	9,947	66.31	42.99	30
1.7	144.4	....	....	7,031	36.6	3,138	16.3	13	34	2	6,106,852	[1] 81,468	644.02	423.74	31
....	141.5	....	....	2,093	13.0	4,100	25.4	....	1	7	1,493,887	13,944	174.30	86.50	32
....	[6] 124.6	....	3.0	(2)	....	(2)	....	....	(2)	2	1,724,682	22,214	183.59	134.79	33
1.3	....	72.0	0.3	*3,000*	25.9	2,785	24.0	....	14	9	1,815,000	20,248	202.48	174.63	34
....	103.1	....	0.2	2,755	24.8	1,044	9.4	....	3	45	1,289,000	21,756	255.95	196.12	35
....	63.2	....	0.1	*1,800*	14.2	*3,760*	44.5	....	2	31	1,594,402	11,165	116.30	132.05	36
....	158.8	....	....	1,800	9.9	3,600	19.7	....	....	18	2,400,000	[10] 37,731	377.31	206.90	37
....	48.5	....	0.5	3,178	44.5	972	13.6	....	4	9	2,375,000	14,924	179.76	209.02	38
....	275.8	....	....	*3,600*	13.0	(2)	....	....	....	3	1,540,000	[3] 10,703	104.91	38.61	39
....	39.2	....	....	1,883	17.6	1,538	14.4	....	....	7	1,500,000	17,113	178.26	160.25	40
2.5	224.6	....	....	*2,000*	8.4	*500*	2.1	....	....	47	2,348,000	23,631	223.86	96.87	41
0.7	145.2	0.1	0.4	3,150	17.6	*1,800*	10.1	....	10	5	....	[3] 17,628	220.35	98.73	42
....	67.0	....	....	305	3.1	*4,500*	45.7	....	....	12	1,850,000	383	5.47	3.89	43
....	72.2	....	....	2,600	24.6	3,473	32.9	....	10	22	3,275,432	12,101	127.38	114.67	44
....	84.9	....	6.5	(2)	....	(2)	....	5	24	26	2,118,797	56,834	585.92	404.11	45
....	168.4	....	....	4,052	20.5	*3,360*	17.0	16	3	7	1,811,365	[3] 12,018	237.74	60.86	46

---

[7] Less than one-tenth of 1 mile.

[8] Includes the value of drainage system, $4,674,888.

[9] Part of the expenses of sewer maintenance is included with the expenses of street cleaning.

[10] Includes expenses of purification.

TABLE 1.—SEWERS—GENERAL STATISTICS

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see

City number.	CITY.	POPULATION.		Area (acres) served by sewer system (estimate).	MILEAGE OF SEWERS.								
		Total.	Served by sewer system (estimate).		Total.	Classified by character.			Classified by construction material.				
						Sanitary.	Combined.	Storm-water.	Stone.	Brick.	Brick and concrete.	Brick and stone.	Concrete.
GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.													
47	Albany, N. Y	99,813	95,888	6,914	101.4		101.4			16.3	0.4	22.3	
48	Bridgeport, Conn	99,301	90,000	4,500	91.0		91.0			7.0			
49	Spokane, Wash	98 947	50,000	13,000	63.6		63.6			0.3			0.5
50	Hartford, Conn	97,225	97,000	6,810	116.6		115.6	1.0		55.8	0.5		0.9
51	Reading, Pa	94,555	72,000	3,000	115.8	101.8		14.0					
52	Trenton, N. J	94,547	60,000	(1)	91.3	64.8	15.2	11.3		13.1			7.3
53	San Antonio, Tex	92,777	67,500	7,680	98.9	92.7		6.2		7.8			
54	New Bedford, Mass	92,718	90,000	4,950	87.9	3.9	82.4	1.6	0.2	18.3			
55	Camden, N. J	92,532	45,000	2,237	70.8		70.8			70.8			
56	Dallas, Tex	87,606	48,750	6,115	131.2	117.4		13.8		4.0			0.6
57	Salt Lake City, Utah	87,830	65,000	4,480	124.7	124.2		0.5			6.9		3.5
58	Lynn, Mass	87,166	82,808	1,781	78.1		77.5	0.6		15.3			
59	Wilmington, Del	86,444	60,000	3,500	96.9	2.9	94.0			15.7			0.7
60	Springfield, Mass	86,210	82,000	4,800	118.8	1.1	117.2	0.5		26.1	0.1	0.4	3.0
61	Des Moines, Iowa	84,592	60,000	5,760	119.0	5.7	110.6	2.7		20.8			1.4
62	Lawrence, Mass	83,096	80,000	1,990	69.8	3.0	66.2	0.6		18.8	1.6		
63	St. Joseph, Mo	[7] 77,403	70,650	3,720	93.6		93.6			9.7			1.1
64	Troy, N. Y	76,715	70,000	4,113	54.2		54.2			31.6			
65	Yonkers, N. Y	76,502	60,000	2,500	48.6	0.5	47.7	0.4	0.2	11.6			
66	Tacoma, Wash	76,320	60,800	7,680	202.8	173.9		28.9		0.2			
67	Youngstown, Ohio	76,245	60,000	3,840	92.2		92.2			17.3			
68	Duluth, Minn	76,038	57,000	6,400	101.6	79.9		21.7		7.0		0.8	3.5
69	Houston, Tex	75,949	32,400	3,010	63.2	48.6	6.5	8.1		4.4			0.3
70	Somerville, Mass	75,830	75,830	2,432	100.3	25.8	67.9	6.6	0.3	29.8	0.8		(8)
71	Kansas City, Kans	74,798	66,500	5,814	74.3		74.3			16.8			
72	Utica, N. Y	72,485	72,000	5,600	88.8	2.2	81.6	5.0	0.8	10.6		3.0	1.0
73	Waterbury, Conn	71,191	45,000	(1)	53.6	46.8		6.8		3.9			2.4
74	Elizabeth, N. J	71,138	65,000	3,115	71.3		71.3			13.4			
75	Schenectady, N. Y	70,203	68,000	4,500	96.3	79.8	1.1	15.4	1.1	0.1			
76	Hoboken, N. J	69,452	52,110	619	19.4		19.4			13.4			
77	Manchester, N. H	68,904	60,000	3,247	84.4		84.4			8.8			
78	Evansville, Ind	68,747	23,000	2,723	42.2		42.2			12.3			
79	Birmingham, Ala	68,600	45,000	3,846	96.2	76.8		19.4		20.3			
80	Akron, Ohio	66,733	40,000	5,000	108.4	101.6		6.8		9.6			
81	Norfolk, Va	66,492	42,000	2,146	90.7	82.7		8.0					
82	Fort Worth, Tex	66,420	46,476	9,688	*119.0*	*115.0*		*4.0*					
83	Wilkes-Barre, Pa	65,742	50,000	2,214	73.0	(1)	73.0	(1)		3.3			
84	Erie, Pa	65,302	60,000	3,472	81.8		81.8			11.5			1.2
85	Savannah, Ga	64,725	40,000	2,160	77.0	51.0		26.0		15.3			
86	Peoria, Ill	62,095	60,000	5,090	96.9		94.5	2.4		33.8			
87	Harrisburg, Pa	61,075	50,000	2,500	63.4		63.4		0.1	23.5			4.0
88	Fort Wayne, Ind	60,925	42,000	5,000	90.0		90.0			22.0			
89	Charleston, S. C	58,564	15,000	400	70.5	5.4		65.1		23.5			
90	Portland, Me	57,824	(1)	(1)	71.9	22.2	49.7			15.9		0.3	
91	Terre Haute, Ind	57,316	35,000	1,920	56.9		56.9			8.8			
92	East St. Louis, Ill	56,682	45,000	2,800	51.0		51.0			0.5			
93	Holyoke, Mass	56,377	55,000	3,000	45.4		43.9	1.5		9.0			0.7
94	Brockton, Mass	55,275	40,000	2,200	73.9	57.8		16.1			3.6		
95	Johnstown, Pa	53,833	30,000	(1)	38.0		38.0			0.9			
96	Jacksonville, Fla	53,608	40,000	3,240	73.3	53.3	12.0	8.0		8.0			
97	Oklahoma City, Okla	53,273	35,000	3,000	145.6	92.1	4.5	49.0		2.6			9.0
98	Bayonne, N. J	53,160	32,000	2,000	31.5		31.5			7.0			
99	Covington, Ky	52,720	35,000	2,890	54.8		54.8		2.7	4.6			0.9
100	South Bend, Ind	52,087	28,000	4,300	61.3		61.3			12.5			1.2
101	Passaic, N. J	51,733	40,000	1,400	45.6	36.0	9.6			0.9			
102	Altoona, Pa	51,287	45,000	1,650	73.8	72.6		1.2		10.7	1.1		
103	Mobile, Ala	51,250	37,500	6,500	108.9	90.0		18.9					3.7
104	Allentown, Pa	50,652	500	4	12.7		0.6	12.1		2.7	2.7		
105	Pawtucket, R. I	50,142	40,000	3,814	57.1		57.1			8.1			1.1

---

[1] Not reported.
[2] Includes expenses of pumping.
[3] Includes value of pumping station and sewage-disposal plant.
[4] Includes expenses of pumping and purification.
[5] Includes value of sewage pumping plant, $33,210, and that of sewer farm dump, $13,812.
[6] Includes expenses of purification.

OF SEWER SYSTEMS: 1909—Continued.

page 85. For a text discussion of this table, see page 20. Figures printed in italics are estimates.]

MILEAGE OF SEWERS—continued.				NUMBER OF MANHOLES.		NUMBER OF CATCH BASINS.		Number of inverted siphons.	Number of storm-water overflows.	Number of outlets.	Cost, or replacement value, of system.	EXPENSES OF OPERATION AND MAINTENANCE.			City number.
Classified by construction material—Continued.				Total.	Per mile of sewer.	Total.	Per mile of sewer.					Total.	Per 1,000 population served.	Per mile of sewer.	
Reinforced concrete.	Vitrified pipe.	Cement pipe.	All other.												
GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.															
0.1	60.9	0.9	0.5	(1)	...	*1,500*	14.8	...	2	33	...	$11,531	$120.25	$113.72	47
...	29.0	55.0	...	*2,366*	26.0	1,559	17.1	1	...	25	$1,370,000	9,500	105.56	104.40	48
...	62.8	...	...	1,866	29.4	2,060	31.5	...	2	9	1,197,754	7,056	141.12	111.01	49
...	55.6	1.8	2.0	*1,750*	15.0	2,151	18.4	10	30	4	1,490,000	[2] 15,574	160.56	133.57	50
...	101.8	...	14.0	(1)	...	660	5.7	...	7	1	[3] 1,395,000	[4] 57,658	890.81	497.78	51
...	70.3	...	0.6	1,600	17.5	(1)	...	2	5	1	...	6,489	108.15	71.09	52
...	91.1	...	...	950	9.6	(1)	...	4	...	1	610,400	9,840	145.78	99.49	53
0.6	66.7	1.8	0.3	779	8.9	1,026	11.7	...	...	48	1,331,581	24,511	272.34	278.98	54
...	...	...	...	1,400	19.8	*1,200*	16.9	...	(1)	18	748,298	5,008	111.29	70.69	55
...	126.6	...	...	244	1.9	*500*	3.8	...	...	9	614,757	5,642	115.73	42.99	56
...	113.4	...	0.9	1,839	14.7	...	...	...	...	1	[5] 1,899,121	[2] 21,396	329.17	171.58	57
0.1	62.4	...	0.3	1,525	19.5	1,215	15.6	...	*3*	1	1,539,906	[2] 12,754	154.02	163.35	58
1.6	77.6	1.0	0.3	1,218	12.6	30	0.3	1	...	20	1,200,000	9,299	154.98	96.96	59
...	64.5	24.5	0.2	*1,880*	15.8	(1)	...	1	16	14	1,450,290	17,238	210.22	145.10	60
...	96.8	...	...	*1,680*	14.1	*1,400*	11.8	...	2	8	1,463,351	[6] 15,932	265.53	133.83	61
0.1	49.1	...	0.2	1,315	18.8	1,271	18.2	1	11	19	1,340,997	25,613	320.16	367.11	62
2.1	80.7	...	...	1,443	15.4	2,320	24.8	...	...	13	2,047,500	10,604	150.09	113.34	63
...	22.6	...	...	*716*	13.2	(1)	...	...	(1)	(1)	1,018,000	11,119	158.84	205.07	64
...	35.5	...	1.3	*1,450*	29.9	*1,000*	20.6	...	...	9	...	4,502	75.03	92.71	65
0.7	201.9	...	...	*3,600*	17.7	*1,500*	7.4	...	*50*	8	1,560,000	17,729	291.60	87.41	66
...	74.9	...	...	1,234	13.4	*3,500*	38.0	...	(1)	8	1,030,018	10,170	169.50	110.36	67
...	89.3	...	1.0	1,560	15.4	840	8.3	...	(1)	9	1,827,427	15,545	272.72	153.00	68
0.3	52.4	...	5.8	773	12.2	503	8.0	7	3	57	503,400	[4] 23,641	729.66	374.36	69
...	69.4	...	(8)	1,721	17.2	1,565	15.7	2	10	14	1,233,725	35,084	462.67	349.90	70
...	57.5	...	...	1,769	23.8	760	10.2	...	5	9	800,000	3,275	49.25	44.05	71
...	40.1	31.8	1.5	1,158	13.0	1,961	22.1	4	...	7	929,964	6,551	90.99	73.75	72
...	47.0	...	0.3	(1)	...	(1)	...	...	...	8	1,347,000	18,069	401.53	336.79	73
...	57.9	...	...	(1)	...	(1)	...	...	2	12	969,219	6,297	96.88	88.28	74
0.9	93.8	...	0.4	*1,270*	13.2	398	4.1	...	(1)	11	1,192,000	11,857	174.37	123.18	75
...	...	2.8	3.2	1,022	52.8	560	28.9	...	...	5	...	11,474	220.19	592.36	76
...	69.8	5.6	0.2	1,236	14.6	(1)	...	...	2	14	861,150	5,733	95.55	67.90	77
1.7	28.2	...	...	*480*	9.9	*1,680*	39.8	...	...	16	642,073	3,489	151.70	82.60	78
...	75.9	...	...	*1,250*	13.0	*40*	0.4	...	3	2	636,127	7,122	158.27	74.06	79
3.0	95.8	...	...	*500*	4.6	*450*	4.2	...	4	2	792,311	[6] 10,918	272.95	100.72	80
0.5	90.0	...	0.2	*1,500*	16.5	*840*	9.3	1	...	5	[9] 942,964	[2] 34,394	818.90	379.21	81
4.0	*115.0*	...	...	*250*	2.1	(1)	...	...	...	4	555,000	6,765	145.55	56.85	82
...	69.7	...	...	212	2.9	(1)	...	...	2	11	647,000	8,906	178.12	121.95	83
...	69.1	...	...	1,312	16.0	*900*	11.0	...	...	8	999,180	3,058	50.97	37.41	84
...	60.9	...	0.8	(1)	...	1,423	18.5	...	...	2	680,000	9,050	226.25	117.53	85
...	63.1	...	...	1,144	11.8	1,027	10.6	...	...	15	1,762,403	7,912	131.87	81.67	86
...	34.1	0.4	1.3	(1)	...	2,500	39.4	10	6	63	...	20,093	401.86	316.77	87
...	68.0	...	...	*1,800*	20.0	*800*	8.9	...	6	1	1,973,950	4,456	106.10	49.51	88
...	47.0	...	...	(1)	...	(1)	...	1	...	2	...	[2] 8,416	561.07	119.38	89
...	36.8	16.2	2.7	(1)	...	1,224	17.0	...	...	25	...	19,328	...	268.86	90
...	48.1	...	...	686	12.1	293	5.2	...	...	4	543,112	6,050	172.86	106.38	91
...	50.5	...	...	*1,000*	19.6	*1,500*	29.4	...	...	4	[10] 4,750	[2] 14,289	317.53	280.18	92
...	34.7	...	1.0	*700*	15.4	*800*	17.0	...	...	7	648,419	4,451	80.93	98.13	93
...	68.4	...	1.9	873	11.8	400	5.4	7	...	10	1,172,680	[4] 17,076	426.90	231.04	94
...	37.1	...	...	(1)	...	389	10.2	...	(1)	31	93,000	6,419	213.97	168.92	95
...	65.3	...	...	(1)	...	350	4.8	2	2	8	644,825	[2] 16,772	419.30	228.84	96
...	134.0	...	...	*800*	5.5	*1,700*	11.7	3	2	5	675,000	5,617	160.49	38.58	97
...	23.5	...	1.0	*700*	22.2	*400*	12.7	...	(1)	8	416,000	(1)	...	...	98
...	46.6	...	...	1,415	25.8	631	12.4	...	...	30	...	6,389	182.54	116.52	99
...	47.6	...	...	1,293	21.1	7,758	126.6	...	...	5	687,379	173	6.18	2.82	100
...	44.2	...	0.5	466	10.2	225	4.9	...	...	13	408,457	4,724	118.10	103.51	101
...	62.0	...	...	260	3.5	*156*	2.1	2	4	4	707,000	[6] 6,329	140.64	85.76	102
...	105.2	...	...	650	6.0	(1)	...	...	...	6	462,000	5,599	149.31	51.41	103
...	6.9	...	0.4	(1)	...	(1)	...	...	2	1	106,000	305	730.00	28.74	104
...	47.8	0.1	...	1,518	26.6	1,093	19.2	...	5	11	1,131,263	[6] 14,754	368.85	258.52	105

---

[7] Population of April 15, 1910; estimate can not be made for 1909.
[8] Less than one-tenth of 1 mile.
[9] Includes value of sewage pumping station, $141,650.
[10] Value of pumps only.

Table 1.—SEWERS—GENERAL STATISTICS

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see

City number.	CITY.	POPULATION.		Area (acres) served by sewer system (estimate).	MILEAGE OF SEWERS.								
		Total.	Served by sewer system (estimate).		Total.	Classified by character.			Classified by construction material.				
						Sanitary.	Combined.	Storm-water.	Stone.	Brick.	Brick and concrete.	Brick and stone.	Concrete.
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.												
106	Saginaw, Mich	49,929	45,000	4,000	94.3	...	94.3	...	...	25.6	...	...	6.8
107	Canton, Ohio	48,927	32,000	3,964	97.6	75.3	...	22.3	...	9.8	...	...	...
108	Wichita, Kans	48,806	30,000	6,000	126.4	94.0	...	32.4	...	14.0	...	...	...
109	Springfield, Ill	48,799	20,000	3,259	61.5	...	61.5	...	...	...	37.8	...	...
110	Binghamton, N. Y	47,483	40,000	3,787	52.7	...	51.6	1.1	...	11.1	...	...	...
111	Lancaster, Pa	46,715	36,000	1,920	43.0	...	43.0	...	...	12.0	...	...	...
112	Sioux City, Iowa	46,690	22,000	2,864	77.8	42.8	17.4	17.6	...	5.5	...	...	...
113	Little Rock, Ark	44,844	38,000	4,750	64.0	62.0	...	2.0	1.0	1.0	...	...	...
114	Springfield, Ohio	44,688	18,000	2,400	31.6	17.4	12.7	1.5	...	2.8	...	...	3.2
115	Atlantic City, N. J	44,613	(4)	...	...	...	...	...	...	...	...	...	...
116	Bay City, Mich	44,492	30,000	4,500	103.1	...	103.1	...	...	...	18.1	...	...
117	Rockford, Ill	44,240	27,840	2,155	55.1	53.5	...	1.6	...	...	...	...	...
118	York, Pa	43,702	(5)	2,000	46.0	41.0	...	5.0	...	1.2	...	...	...
119	Lincoln, Nebr	43,635	35,000	2,500	61.9	50.7	2.7	8.5	0.3	2.8	...	...	0.2
120	Chattanooga, Tenn	43,634	38,000	2,478	74.2	16.1	58.1	...	...	13.2	...	...	...
121	Topeka, Kans	43,531	25,000	2,880	*87.4*	...	*87.4*	...	...	*6.0*	...	...	*1.0*
122	Sacramento, Cal	43,330	35,000	2,600	64.9	...	64.9	...	...	7.1	...	...	2.1
123	Malden, Mass	43,280	33,600	2,050	73.1	52.3	...	20.8	...	1.1	...	...	10.2
124	Haverhill, Mass	43,005	35,000	2,176	45.9	3.6	41.1	1.2	...	8.0	1.0	...	...
125	Pueblo, Colo	42,999	35,000	5,120	89.4	79.6	9.8	...	...	4.3	...	...	...
126	Salem, Mass	42,626	(2)	(2)	50.8	...	50.8	...	...	3.3	...	...	...
127	New Britain, Conn	42,523	35,000	3,200	86.9	61.3	...	25.6	...	12.5	...	...	1.1
128	Davenport, Iowa	42,495	25,000	2,500	71.6	...	69.5	2.1	0.8	4.9	...	...	...
129	McKeesport, Pa	42,032	35,000	1,400	33.2	...	33.1	0.1	...	4.3	...	...	...
130	Wheeling, W. Va	41,396	40,000	1,000	43.8	...	43.8	...	...	3.0	...	...	...
131	Augusta, Ga	40,899	35,000	2,200	63.5	...	63.5	...	...	23.0	...	...	...
132	Superior, Wis	39,695	32,000	8,000	56.6	...	56.6	...	...	20.0	...	...	...
133	Newton, Mass	39,280	30,900	4,454	164.5	107.9	...	56.6	2.9	16.9	...	...	4.6
134	Dubuque, Iowa	39,065	29,000	2,800	41.4	31.3	...	10.1	6.5	1.4	...	...	(6)
135	Butte, Mont	38,669	30,000	1,799	33.9	26.9	...	7.0	...	2.1	...	...	0.1
136	Chester, Pa	38,134	25,000	(2)	32.5	...	32.5	...	...	22.0	...	...	...
137	Kalamazoo, Mich	37,999	20,000	3,912	71.7	52.8	...	18.9	...	0.1	...	...	3.6
138	Montgomery, Ala	37,888	30,000	3,424	89.7	53.4	...	36.3	...	6.9	...	...	1.5
139	Woonsocket, R. I	37,060	19,000	1,877	18.5	18.5	...	...	...	1.0	...	...	...
140	Galveston, Tex	[3] 36,981	32,400	1,585	36.8	30.3	2.0	4.5	...	...	...	...	2.1
141	Fitchburg, Mass	36,978	26,000	1,600	40.3	...	40.3	...	...	4.6	...	...	...
142	Racine, Wis	36,976	30,000	2,300	67.2	...	67.2	...	...	6.5	...	...	...
143	Elmira, N. Y	36,915	35,000	3,500	49.6	...	49.6	...	...	5.8	...	...	...
144	Quincy, Ill	36,557	15,000	1,800	34.7	...	32.2	2.5	...	7.4	...	2.1	...
145	Knoxville, Tenn	36,017	32,000	1,265	54.2	42.9	...	11.3	...	2.3	...	...	0.2
146	New Castle, Pa	35,620	30,000	4,000	62.3	54.0	...	8.3	...	1.0	...	...	...
147	Macon, Ga	35,502	30,000	1,446	*73.9*	*53.9*	...	*20.0*	...	...	...	...	...
148	Auburn, N. Y	34,283	28,000	4,896	*85.9*	*2.9*	*82.0*	*1.0*	*3.3*	*16.6*	...	...	...
149	West Hoboken, N. J	34,268	30,000	526	20.2	...	20.2	...	...	6.0	...	...	...
150	Joilet, Ill	34,198	20,000	1,500	35.0	...	35.0	...	5.0	...	...	...	...
151	Taunton, Mass	33,678	10,000	2,000	29.1	27.2	...	1.9	...	9.1	...	...	...
152	Everett, Mass	32,712	32,000	1,330	54.7	42.3	1.0	11.4	...	3.5	11.4	...	...
153	Oshkosh, Wis	32,615	27,500	3,011	73.0	...	73.0	...	...	...	...	...	(6)
154	Chelsea, Mass	32,452	32,000	1,400	37.3	...	35.5	1.8	...	...	...	...	...
155	Joplin, Mo	31,935	20,000	1,120	32.4	32.0	...	0.4	...	0.3	...	...	0.1
156	La Crosse, Wis	30,176	18,000	1,950	28.9	...	28.9	...	...	1.6	...	...	...
157	Newport, Ky	30,130	15,000	640	27.6	...	27.6	...	...	2.8	...	...	0.6
158	South Omaha, Nebr	26,235	6,000	1,000	21.0	7.0	14.0	...	...	0.2	...	...	5.0

[1] Includes expenses of pumping.
[2] Not reported.
[3] Includes expenses of purification.
[4] Sewer system owned by private corporation.
[5] Sewer system not in use, as state laws prohibit the pollution of Codorus Creek, into which the system discharged sewage.
[6] Less than one-tenth of 1 mile.

OF SEWER SYSTEMS: 1909—Continued.

page 85. For a text discussion of this table, see page 20. Figures printed in italics are estimates.]

MILEAGE OF SEWERS—continued.				NUMBER OF MANHOLES.		NUMBER OF CATCH BASINS.		Number of inverted siphons.	Number of storm-water overflows.	Number of outlets.	Cost, or replacement value, of system.	EXPENSES OF OPERATION AND MAINTENANCE.			City number.
Classified by construction material—Continued.				Total.	Per mile of sewer.	Total.	Per mile of sewer.					Total.	Per 1,000 population served.	Per mile of sewer.	
Reinforced concrete.	Vitrified pipe.	Cement pipe.	All other.												
GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.															
...	61.8	...	0.1	358	3.8	3,164	33.5	...	1	23	$1,112,970	¹ $3,473	$77.18	$36.82	106
...	87.8	...	...	1,305	13.4	660	6.8	4	(²)	1	634,810	³ 8,929	279.03	91.46	107
...	112.4	...	...	2,035	16.1	1,100	8.7	(²)	(²)	2	819,827	7,517	250.57	59.49	108
...	23.7	...	...	(²)	...	*3,264*	53.1	...	...	2	928,100	8,595	429.75	139.78	109
0.1	41.5	...	...	782	14.8	1,254	23.8	1	8	18	...	7,668	191.70	145.48	110
1.0	30.0	...	...	(²)	...	(²)	...	...	3	4	...	(²)	...	...	111
...	72.2	...	0.1	1,008	12.9	897	11.5	7	...	7	405,672	¹ 11,720	532.73	150.57	112
...	62.0	...	...	*960*	15.0	8	0.1	...	5	17	150,000	³ 2,004	52.74	31.31	113
...	25.6	...	...	*200*	6.3	*800*	25.3	...	4	6	512,000	4,601	255.61	145.37	114
...	...	...	...	...	...	...	...	...	...	49	...	...	...	...	115
4.0	80.2	...	0.8	371	3.6	1,600	15.5	...	*20*	36	109,262	4,104	136.80	39.81	116
...	55.1	...	...	495	9.0	228	4.1	1	6	49	54,286	9,917	356.21	180.11	117
...	44.8	...	...	(²)	...	(²)	...	1	...	(²)	480,000	² 1,636	(²)	35.57	118
0.5	58.1	...	...	884	14.3	250	4.0	...	1	4	350,000	7,573	216.37	122.42	119
...	61.0	...	...	*1,302*	17.5	*750*	10.1	...	...	9	975,000	3,663	96.39	49.37	120
...	*80.4*	...	...	*700*	8.0	*600*	6.9	...	(²)	10	706,903	1,400	56.00	16.02	121
2.8	52.9	...	...	607	9.4	843	13.0	20	...	1	732,234	¹ 33,800	965.71	520.72	122
...	61.8	...	...	*1,372*	18.8	*500*	6.8	...	...	(²)	702,848	12,953	385.51	177.10	123
...	36.9	...	...	728	15.9	1,560	34.0	...	4	36	...	3,277	93.63	71.36	124
...	84.9	...	0.2	480	5.4	197	2.2	...	...	3	905,000	6,760	193.14	75.57	125
2.9	34.1	6.8	3.7	904	17.8	650	12.8	6	*24*	2	...	¹ 11,318	(²)	222.75	126
...	73.3	...	...	1,100	12.7	504	5.8	...	3	2	1,218,328	³ 9,608	274.51	110.56	127
...	65.5	0.3	0.1	*850*	11.9	*325*	4.5	...	...	17	571,366	6,488	259.52	90.65	128
...	28.9	...	...	570	17.2	*600*	18.1	...	...	34	475,000	10,898	311.37	328.65	129
...	40.8	...	...	215	4.9	158	3.6	...	...	69	1,052,000	6,458	161.45	147.61	130
...	40.5	...	...	(²)	...	1,798	28.3	...	...	7	782,234	3,413	97.51	53.73	131
...	35.3	1.3	...	769	13.6	878	15.5	...	...	9	962,629	15,807	493.97	279.32	132
...	140.1	...	...	3,496	21.3	2,404	14.6	5	3	9	1,922,477	41,976	1,358.45	255.22	133
...	33.5	...	...	769	18.6	650	15.7	...	...	1	129,952	6,479	223.41	156.35	134
...	31.7	...	...	350	10.3	213	6.3	...	...	2	472,054	4,662	155.40	137.64	135
...	10.3	...	0.2	400	12.3	(²)	...	...	1	22	...	7,095	283.80	218.04	136
...	68.0	...	...	548	7.6	639	8.9	...	2	9	...	9,219	460.95	128.52	137
...	81.3	...	...	*500*	5.6	*1,000*	11.2	...	...	14	295,046	1,990	66.33	22.19	138
...	17.5	...	...	672	36.3	(²)	...	5	...	1	447,762	⁷ 12,047	634.05	651.19	139
...	32.0	2.7	...	507	13.8	348	9.5	...	...	14	285,155	8,648	266.91	234.87	140
...	35.7	...	...	997	24.7	800	19.9	...	...	21	400,046	4,536	174.46	112.58	141
...	30.7	30.0	...	769	11.4	*1,100*	16.4	...	2	25	500,000	3,247	108.23	48.30	142
...	40.7	3.1	...	650	13.1	1,601	32.3	...	2	2	233,152	5,276	150.74	106.37	143
...	25.2	...	...	821	23.7	230	6.6	...	...	7	201,100	1,448	96.53	41.73	144
1.4	50.3	...	...	954	17.6	*780*	14.4	...	...	4	440,034	789	24.66	14.56	145
...	61.3	...	...	360	5.8	98	1.6	...	...	26	624,000	4,615	153.83	74.07	146
...	*73.9*	...	...	949	12.8	1,080	14.6	...	...	5	335,000	3,899	129.97	52.78	147
...	*66.0*	...	...	⁹ 320	3.7	*600*	7.0	4	...	3	508,407	³ 2,532	90.43	29.48	148
...	14.2	...	...	440	21.8	420	20.8	...	...	2	...	1,816	60.53	90.03	149
...	30.0	...	...	1,960	56.0	1,960	56.0	...	...	200	475,000	2,195	109.75	62.71	150
...	20.0	...	...	484	16.6	550	18.9	1	7	5	451,000	6,959	695.90	238.89	151
...	39.8	...	...	655	12.0	523	9.6	1	...	6	577,825	11,177	349.28	204.44	152
...	20.2	52.1	0.7	1,253	17.2	(²)	...	...	...	54	300,000	1,017	36.98	13.93	153
...	37.3	...	...	400	10.7	(²)	...	...	8	10	...	15,609	487.78	418.47	154
...	32.0	...	...	350	10.8	50	1.5	...	15	1	250,000	40	2.00	1.23	155
0.3	27.0	...	...	355	12.3	915	31.7	...	1	3	330,000	1,481	82.28	51.32	156
...	24.0	...	0.2	873	31.6	455	16.4	...	5	13	375,000	2,427	161.80	87.81	157
...	15.8	...	...	*250*	11.9	*750*	35.7	...	...	3	280,000	1,650	275.00	78.57	158

[7] Includes expenses of pumping and purification.

[8] Population for April 15, 1910; estimate can not be made.

[9] No record of manholes built prior to 1906.

TABLE 2.—SEWERS—MILEAGE AT CLOSE OF YEAR, CLASSIFIED BY CHARACTER AND BY MATERIAL OF WHICH CONSTRUCTED: 1909.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 24. Figures printed in italics are estimates.]

City number.	CITY.	Total.	MILEAGE OF SEWERS.													
			Sanitary.				Combined.					Storm-water.				
			Total.	Brick.[1]	Vitrified pipe.	All other.	Total.	Brick.[1]	Concrete.[2]	Vitrified pipe.	All other.	Total.	Brick.[1]	Concrete.[2]	Vitrified pipe.	All other.
	Grand total	24,971.9	5,258.3	263.2	4,883.4	111.7	18,361.5	6,027.2	192.0	11,099.6	1,042.7	1,352.1	321.7	76.1	861.0	93.3
	Group I	10,973.7	789.5	106.4	625.1	58.0	9,834.3	3,960.6	73.6	5,290.6	509.5	349.9	98.9	3.2	190.9	56.9
	Group II	6,094.4	1,404.4	62.6	1,318.6	23.2	4,405.8	1,155.5	65.5	2,922.7	262.1	284.2	62.6	24.4	189.2	8.0
	Group III	4,831.2	1,831.5	51.6	1,756.8	23.1	2,615.5	634.3	26.3	1,792.3	162.6	384.2	94.6	25.0	247.8	16.8
	Group IV	3,072.6	1,232.9	42.6	1,182.9	7.4	1,505.9	276.8	26.6	1,094.0	108.5	333.8	65.6	23.5	233.1	11.6
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.															
1	New York, N. Y	1,907.9	146.8	1.8	125.0	20.0	1,738.7	627.2	19.4	636.2	455.9	22.4	12.2	0.2	10.0	......
2	Chicago, Ill	1,837.0	6.5	0.2	6.3	......	1,822.9	621.2	15.0	1,186.7	......	7.6	3.1	......	4.5	......
3	Philadelphia, Pa	1,185.1	97.1	74.8	22.3	......	990.9	945.9	1.8	43.2	......	97.1	74.8	......	22.3	......
4	St. Louis, Mo	649.0	......	......	......	......	649.0	271.3	0.6	369.3	7.8	......	......	......	......	......
5	Boston, Mass	765.6	82.1	10.2	70.2	1.7	588.3	73.3	......	502.3	12.7	95.2	7.9	......	75.0	12.3
6	Baltimore, Md	77.4	......	......	......	......	77.4	34.7	5.4	27.4	9.9	......	......	......	......	......
7	Cleveland, Ohio	529.2	19.1	......	......	19.1	491.0	294.7	12.1	182.1	2.1	19.1	......	......	......	19.1
8	Pittsburgh, Pa	542.2	4.0	......	4.0	......	538.2	78.7	0.6	458.5	0.4	......	......	......	......	......
9	Detroit, Mich	631.6	......	......	......	......	631.6	392.7	1.0	237.9	......	......	......	......	......	......
10	Buffalo, N. Y	507.0	......	......	......	......	507.0	167.0	0.9	335.9	3.2	......	......	......	......	......
11	San Francisco, Cal	358.9	2.7	......	2.7	......	353.1	113.5	0.8	224.6	14.2	3.1	......	1.0	2.1	......
12	Cincinnati, Ohio	326.0	......	......	......	......	326.0	68.2	......	255.8	2.0	......	......	......	......	......
13	Milwaukee, Wis	419.4	......	......	......	......	419.4	123.8	......	295.6	......	......	......	......	......	......
14	Newark, N. J	269.0	58.9	6.6	52.3	......	204.1	65.9	0.1	137.5	0.6	6.0	0.9	2.0	2.0	1.1
15	New Orleans, La	425.0	325.6	6.4	315.9	3.3	......	......	......	......	......	99.4	......	......	75.0	24.4
16	Washington, D. C	543.4	46.7	6.4	26.4	13.9	496.7	82.5	15.9	397.6	0.7	......	......	......	......	......
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.															
17	Minneapolis, Minn	257.4	6.5	......	6.5	......	250.9	104.7	7.2	100.4	38.6	......	......	......	......	......
18	Los Angeles, Cal	439.0	418.6	23.5	386.6	8.5	......	......	......	......	......	20.4	2.8	6.7	10.9	......
19	Jersey City, N. J	126.5	......	......	......	......	122.5	71.7	......	47.8	3.0	4.0	......	......	......	4.0
20	Kansas City, Mo	354.5	......	......	......	......	349.5	74.9	1.3	269.6	3.7	5.0	1.4	0.4	3.2	......
21	Indianapolis, Ind	257.3	13.0	......	......	13.0	239.1	80.5	1.6	153.0	4.0	5.2	......	......	5.2	......
22	Louisville, Ky	152.3	......	......	......	......	152.3	59.4	18.0	74.9	......	......	......	......	......	......
23	Seattle, Wash	247.2	......	......	......	......	247.2	15.6	3.4	228.2	......	......	......	......	......	......
24	Providence, R. I	228.6	......	......	......	......	217.8	68.8	......	149.0	......	10.8	7.5	1.0	2.3	......
25	Rochester, N. Y	266.0	......	......	......	......	265.8	25.7	......	165.9	74.2	0.2	......	......	0.2	......
26	St. Paul, Minn	281.4	12.1	......	12.1	......	267.7	33.6	5.6	185.2	43.3	1.6	......	......	1.6	......
27	Denver, Colo	429.3	334.0	10.0	324.0	......	3.6	3.6	......	......	......	91.7	21.4	......	70.3	......
28	Portland, Oreg	189.0	......	......	......	......	189.0	19.5	......	169.3	0.2	......	......	......	......	......
29	Columbus, Ohio	207.3	19.6	5.2	14.4	......	187.5	78.6	......	108.9	......	0.2	0.2	......	......	......
30	Toledo, Ohio	231.4	......	......	......	......	231.4	148.0	3.7	79.6	0.1	......	......	......	......	......
31	Worcester, Mass	192.3	81.8	13.6	68.2	......	64.8	18.6	0.5	45.6	0.1	45.7	10.6	1.2	30.6	3.3
32	Atlanta, Ga	161.2	......	......	......	......	161.2	19.2	0.5	141.5	......	......	......	......	......	......
33	Syracuse, N. Y	164.8	12.6	......	[3] 12.6	......	152.2	36.3	0.9	[3] 112.0	3.0	......	......	......	......	......
34	New Haven, Conn	116.0	......	......	......	......	116.0	42.3	1.3	......	72.4	......	......	......	......	......
35	Scranton, Pa	110.9	......	......	......	......	110.9	6.6	......	103.1	1.2	......	......	......	......	......
36	Paterson, N. J	84.6	2.0	......	2.0	......	82.6	21.3	......	61.2	0.1	......	......	......	......	......
37	Omaha, Nebr	182.4	51.8	......	51.8	......	130.6	22.7	0.9	107.0	......	......	......	......	......	......
38	Fall River, Mass	71.4	......	......	......	......	71.4	21.5	......	48.5	1.4	......	......	......	......	......
39	Memphis, Tenn	277.2	277.2	1.4	275.8	......	......	......	......	......	......	......	......	......	......	......
40	Richmond, Va	106.8	1.0	......	1.0	......	105.8	60.7	0.3	38.2	6.6	......	......	......	......	......
41	Oakland, Cal	239.0	9.7	......	9.4	0.3	225.4	2.8	7.4	215.2	......	3.9	2.0	1.9	......	......
42	Grand Rapids, Mich	178.5	16.4	2.0	14.3	0.1	147.7	18.0	10.4	118.9	0.4	14.4	1.7	0.7	12.0	......
43	Nashville, Tenn	98.5	......	......	......	......	98.5	27.3	0.8	67.0	3.4	......	......	......	......	......
44	Lowell, Mass	105.5	1.2	......	1.2	......	102.3	32.2	......	69.0	1.1	2.0	......	......	2.0	......
45	Cambridge, Mass	140.6	23.7	4.4	18.2	1.1	110.6	41.4	0.2	63.7	5.3	6.3	3.3	......	3.0	......
46	Dayton, Ohio	197.5	123.2	2.5	120.5	0.2	1.5	......	1.5	......	......	72.8	11.7	12.5	47.9	0.7

[1] Includes mileage of brick and concrete, and brick and stone sewers.
[2] Includes mileage of reinforced concrete sewers.
[3] Includes mileage of cement pipe sewers.

TABLE 2.—SEWERS—MILEAGE AT CLOSE OF YEAR, CLASSIFIED BY CHARACTER AND BY MATERIAL OF WHICH CONSTRUCTED: 1909—Continued.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 24. Figures printed in italics are estimates.]

City number.	CITY.	Total.	MILEAGE OF SEWERS.													
			Sanitary.				Combined.					Storm-water.				
			Total.	Brick.[1]	Vitrified pipe.	All other.	Total.	Brick.[1]	Concrete.[2]	Vitrified pipe.	All other.	Total.	Brick.[1]	Concrete.[2]	Vitrified pipe.	All other.
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.															
47	Albany, N. Y	101.4					101.4	39.9	0.1	60.9	1.4					
48	Bridgeport, Conn	91.0					91.0	7.0		29.0	55.0					
49	Spokane, Wash	63.6					63.6	0.3	0.5	62.8						
50	Hartford, Conn	116.6					115.6	55.7	0.5	55.6	3.8	1.0	0.6	0.4		
51	Reading, Pa	115.8	101.8		101.8							14.0				14.0
52	Trenton, N. J	91.3	64.8	2.7	56.8	5.3	15.2	8.2	0.6	6.2	0.2	11.3	2.2	1.7	7.3	0.1
53	San Antonio, Tex	98.9	92.7	7.8	84.9							6.2			6.2	
54	New Bedford, Mass	87.9	3.9		3.9		82.4	18.3	0.4	61.4	2.3	1.6		0.2	1.4	
55	Camden, N. J	70.8					70.8	70.8								
56	Dallas, Tex	131.2	117.4	0.9	116.5							13.8	3.1	0.6	10.1	
57	Salt Lake City, Utah	124.7	124.2	6.9	112.9	4.4						0.5			0.5	
58	Lynn, Mass	78.1					77.5	15.3	0.1	61.8	0.3	0.6			0.6	
59	Wilmington, Del	96.9	2.9	1.0	1.5	0.4	94.0	14.7	2.2	76.1	1.0					
60	Springfield, Mass	118.8	1.1		1.1		117.2	26.6	3.0	62.9	24.7	0.5			0.5	
61	Des Moines, Iowa	119.0	5.7		5.7		110.6	20.4	1.4	88.8		2.7	0.4		2.3	
62	Lawrence, Mass	69.8	3.0		3.0		66.2	20.1		45.9	0.2	0.6	0.3	0.1	0.2	
63	St. Joseph, Mo	93.6					93.6	9.7	3.2	80.7						
64	Troy, N. Y	54.2					54.2	31.6		22.6						
65	Yonkers, N. Y	48.6	0.5		0.5		47.7	11.6		34.6	1.5	0.4			0.4	
66	Tacoma, Wash	202.8	173.9		173.4	0.5						28.9	0.2	0.2	28.5	
67	Youngstown, Ohio	92.2					92.2	17.3		74.9						
68	Duluth, Minn	101.6	79.9	2.0	76.9	1.0						21.7	5.8	3.5	12.4	
69	Houston, Tex	63.2	48.6		43.8	4.8	6.5	1.4	0.2	4.9		8.1	3.0	0.4	3.7	1.0
70	Somerville, Mass	100.3	25.8	0.5	25.3		67.9	27.8		40.1		6.6	2.3	(3)	4.0	0.3
71	Kansas City, Kans	74.3					74.3	16.8		57.5						
72	Utica, N. Y	88.8	2.2		2.2		81.6	11.7	1.0	35.2	33.7	5.0	1.9		2.7	0.4
73	Waterbury, Conn	53.6	46.8	3.9	40.2	2.7						6.8	(3)		6.8	
74	Elizabeth, N. J	71.3					71.3	13.4		57.9						
75	Schenectady, N. Y	96.3	79.8	0.1	78.4	1.3	1.1				1.1	15.4	(3)		15.4	
76	Hoboken, N. J	19.4					19.4	13.4			6.0					
77	Manchester, N. H	84.4					84.4	8.8		69.8	5.8					
78	Evansville, Ind	42.2					42.2	12.3	1.7	28.2						
79	Birmingham, Ala	96.2	76.8	0.9	75.9							19.4	19.4			
80	Akron, Ohio	108.4	101.6	7.8	93.8							6.8	1.8	3.0	2.0	
81	Norfolk, Va	90.7	82.7		82.7							8.0		0.5	7.3	0.2
82	Fort Worth, Tex	119.0	115.0		115.0							*4.0*		*4.0*		
83	Wilkes-Barre, Pa	73.0	(4)	(4)	(4)	(4)	73.0	3.3		69.7						
84	Erie, Pa	81.8					81.8	11.5	1.2	69.1						
85	Savannah, Ga	77.0	51.0	2.3	47.9	0.8						26.0	13.0		13.0	
86	Peoria, Ill	96.9					94.5	31.9		62.6		2.4	1.9		0.5	
87	Harrisburg, Pa	63.4					63.4	23.5	4.0	34.1	1.8					
88	Fort Wayne, Ind	90.0					90.0	22.0		68.0						
89	Charleston, S. C	70.5	5.4		5.4							65.1	23.5		41.6	
90	Portland, Me	71.9	22.2		22.2		49.7	16.2		14.6	18.9					
91	Terre Haute, Ind	56.9					56.9	8.8		48.1						
92	East St. Louis, Ill	51.0					51.0	0.5		50.5						
93	Holyoke, Mass	45.4					43.9	9.0		34.3	0.6	1.5		0.7	0.4	0.4
94	Brockton, Mass	73.9	57.8	3.6	52.3	1.9						16.1			16.1	
95	Johnstown, Pa	38.0					38.0	0.9		37.1						
96	Jacksonville, Fla	73.3	53.3		53.3		12.0			12.0		8.0	8.0			
97	Oklahoma City, Okla	145.6	92.1		92.1		4.5	1.4	3.0	0.1		49.0	1.2	6.0	41.8	
98	Bayonne, N. J	31.5					31.5	7.0		23.5	1.0					
99	Covington, Ky	54.8					54.8	4.6	0.9	46.6	2.7					
100	South Bend, Ind	61.3					61.3	12.5	1.2	47.6						
101	Passaic, N. J	45.6	36.0		36.0		9.6	0.9		8.2	0.5					
102	Altoona, Pa	73.8	72.6	11.2	61.4							1.2	0.6		0.6	
103	Mobile, Ala	108.9	90.0		90.0							18.9		3.7	15.2	
104	Allentown, Pa	12.7					0.6			0.6		12.1	5.4		6.3	0.4
105	Pawtucket, R. I	57.1					57.1	8.1	1.1	47.8	0.1					

---

[1] Includes mileage of brick and concrete, and brick and stone sewers.

[2] Includes mileage of reinforced concrete sewers.

[3] Less than one-tenth of 1 mile.

[4] Not reported.

TABLE 2.—SEWERS—MILEAGE AT CLOSE OF YEAR, CLASSIFIED BY CHARACTER AND BY MATERIAL OF WHICH CONSTRUCTED: 1909—Continued.

[For a list of cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 24. Figures printed in italics are estimates.]

City number.	CITY.	Total.	MILEAGE OF SEWERS.													
			Sanitary.				Combined.					Storm-water.				
			Total.	Brick.[1]	Vitrified pipe.	All other.	Total.	Brick.[1]	Concrete.[2]	Vitrified pipe.	All other.	Total.	Brick.[1]	Concrete.[2]	Vitrified pipe.	All other.
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.															
106	Saginaw, Mich	94.3					94.3	25.6	6.8	61.8	0.1					
107	Canton, Ohio	97.6	75.3	0.6	74.7							22.3	9.2		13.1	
108	Wichita, Kans	126.4	94.0	3.0	91.0							32.4	11.0		21.4	
109	Springfield, Ill	61.5					61.5	37.8		23.7						
110	Binghamton, N. Y	52.7					51.6	11.1		40.5		1.1		0.1	1.0	
111	Lancaster, Pa	43.0					43.0	12.0	1.0	30.0						
112	Sioux City, Iowa	77.8	42.8	0.5	42.3		17.4	1.0		16.3	0.1	17.6	4.0		13.6	
113	Little Rock, Ark	64.0	62.0		62.0							2.0	1.0			1.0
114	Springfield, Ohio	31.6	17.4	1.1	13.1	3.2	12.7	0.7		12.0		1.5	1.0		0.5	
115	Atlantic City, N. J	(3)														
116	Bay City, Mich	103.1					103.1	18.1	4.0	80.2	0.8					
117	Rockford, Ill	55.1	53.5		53.5							1.6			1.6	
118	York, Pa	[4] 46.0	41.0		41.0							5.0	1.2		3.8	
119	Lincoln, Nebr	61.9	50.7		50.7		2.7	0.8	0.1	1.8		8.5	2.0	0.7	5.6	0.2
120	Chattanooga, Tenn	74.2	16.1		16.1		58.1	13.2		44.9						
121	Topeka, Kans	*87.4*					87.4	6.0	1.0	80.4						
122	Sacramento, Cal	*64.9*					64.9	7.1	4.9	52.9						
123	Malden, Mass	73.1	52.3	1.1	51.2							20.8		10.2	10.6	
124	Haverhill, Mass	45.9	3.6		3.6		41.1	8.4		32.7		1.2	0.6		0.6	
125	Pueblo, Colo	89.4	79.6		79.6		9.8	4.3		5.3	0.2					
126	Salem, Mass	50.8					50.8	3.3	2.9	34.1	10.5					
127	New Britain, Conn	86.9	61.3	9.3	50.9	1.1						25.6	3.2		22.4	
128	Davenport, Iowa	71.6					69.5	3.7		64.9	0.9	2.1	1.2		0.6	0.3
129	McKeesport, Pa	33.2					33.1	4.4		28.7		0.1			0.1	
130	Wheeling, W. Va	43.8					43.8	2.9		40.9						
131	Augusta, Ga	63.5					63.5	23.0		40.5						
132	Superior, Wis	56.6					56.6	20.0		35.3	1.3					
133	Newton, Mass	164.5	107.9	10.6	96.2	1.1						56.6	6.3	3.5	43.9	2.9
134	Dubuque, Iowa	41.4	31.3	0.3	31.0							10.1	1.1	(5)	2.5	6.5
135	Butte, Mont	33.9	26.9		26.9							7.0	2.1	0.1	4.8	
136	Chester, Pa	32.5					32.5	22.0		10.3	0.2					
137	Kalamazoo, Mich	71.7	52.8		52.8							18.9	0.1	3.6	15.2	
138	Montgomery, Ala	89.7	53.4		53.4							36.3	6.9	1.5	27.9	
139	Woonsocket, R. I	18.5	18.5	1.0	17.5											
140	Galveston, Tex	36.8	30.3		28.3	2.0	2.0			2.0		4.5		2.1	1.7	0.7
141	Fitchburg, Mass	40.3					40.3	4.6		35.7						
142	Racine, Wis	67.2					*67.2*	6.5		30.7	*30.0*					
143	Elmira, N. Y	49.6					49.6	5.8		40.7	3.1					
144	Quincy, Ill	34.7					32.2	7.1		25.1		2.5	2.4		0.1	
145	Knoxville, Tenn	54.2	42.9	2.0	40.9							11.3	0.3	1.6	9.4	
146	New Castle, Pa	62.3	54.0	1.0	53.0							8.3			8.3	
147	Macon, Ga	*73.9*	*53.9*		*53.9*							*20.0*			20.0	
148	Auburn, N. Y	*85.9*	2.9	0.8	2.1		*82.0*	*15.8*		*62.9*	*3.3*	1.0			1.0	
149	West Hoboken, N. J	20.2					20.2	6.0		14.2						
150	Joliet, Ill	35.0					35.0			30.0	5.0					
151	Taunton, Mass	29.1	27.2	8.8	18.4							1.9	0.3		1.6	
152	Everett, Mass	54.7	42.3	2.5	39.8		1.0	1.0				11.4	11.4			
153	Oshkosh, Wis	73.0					73.0		(5)	20.2	52.8					
154	Chelsea, Mass	37.3					35.5			35.5		1.8			1.8	
155	Joplin, Mo	32.4	32.0		32.0							0.4	0.3	0.1		
156	La Crosse, Wis	28.9					28.9	1.6	0.3	27.0						
157	Newport, Ky	27.6					27.6	2.8	0.6	24.0	0.2					
158	South Omaha, Nebr	21.0	7.0		7.0		14.0	0.2	5.0	8.8						

---

[1] Includes mileage of brick and concrete, and brick and stone sewers.
[2] Includes mileage of reinforced concrete sewers.
[3] Sewer system owned by private corporation.
[4] Sewer system not in use, as state laws prohibit the pollution of Codorus Creek, into which the system discharged sewage.
[5] Less than one-tenth of 1 mile.

TABLE 8.—SEWERS—MILEAGE BUILT DURING YEAR: 1909.

[Cities not reporting sewers built during year are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 24.]

City number.	CITY.	Total.	CLASSIFIED BY CHARACTER.			CLASSIFIED BY BUILDER.											
						City employees.						Contractors.					
			Sanitary.	Combined.	Storm-water.	Total.	Brick.	Concrete.	Reinforced concrete.	Vitrified pipe.	All other.	Total.	Brick.	Concrete.	Reinforced concrete.	Vitrified pipe.	All other.
-	Grand total	1,236.9	464.7	659.8	112.4	137.0	2.6	4.6	9.4	118.6	1.8	1,099.9	126.2	35.4	30.2	887.1	21.0
	Group I	314.7	55.0	249.7	10.0	35.3	0.2	1.2	(1)	33.4	0.5	279.4	57.2	9.9	5.6	201.7	5.0
	Group II	394.7	177.8	202.1	14.8	45.3	1.8		8.0	35.2	0.3	349.4	22.7	9.2	14.7	294.9	7.9
	Group III	323.9	153.1	135.9	34.9	29.8	0.1	0.8	1.2	27.0	0.7	294.1	28.8	11.1	6.3	245.5	2.4
	Group IV	203.6	78.8	72.1	52.7	26.6	0.5	2.6	0.2	23.0	0.3	177.0	17.5	5.2	3.6	145.0	5.7

GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.

City number.	CITY.	Total.	Sanitary.	Combined.	Storm-water.	City employees: Total.	Brick.	Concrete.	Reinforced concrete.	Vitrified pipe.	All other.	Contractors: Total.	Brick.	Concrete.	Reinforced concrete.	Vitrified pipe.	All other.
1	New York, N. Y	39.9	2.0	37.7	0.2							39.9	4.2	3.6	1.4	30.6	0.1
	Bronx Borough	13.8	(1)	13.8								13.8	1.4	3.2		9.2	
	Brooklyn Borough	17.7	0.4	17.1	0.2							17.7	2.6	0.4	0.3	14.3	0.1
	Manhattan Borough	1.7		1.7								1.7	0.2			1.5	
	Queens Borough	4.8	0.6	4.2								4.8			0.8	4.0	
	Richmond Borough	1.9	1.0	0.9								1.9			0.3	1.6	
2	Chicago, Ill	67.1		67.1		0.2				0.2		66.9	11.5	4.7		50.7	
3	Philadelphia, Pa	38.0	(2)	[3] 38.0	(2)							38.0	32.6		1.3	3.6	0.5
4	St. Louis, Mo	9.9		9.9								9.9	1.0		0.2	8.4	0.3
5	Boston, Mass	20.6	11.0	0.7	8.9	8.1	0.2	1.2	(1)	6.5	0.2	12.5	0.2	1.6	0.7	10.0	
6	Baltimore, Md	7.6		7.6		2.2		(1)		2.1	0.1	5.4			0.1	3.4	1.9
7	Cleveland, Ohio	24.3		24.3								24.3	2.9			20.6	0.8
8	Pittsburgh, Pa	15.2	3.3	11.9								15.2				15.2	
9	Detroit, Mich	14.0		14.0								14.0	0.7			13.3	
10	Buffalo, N. Y	5.1		5.1								5.1	1.3			3.8	(1)
11	San Francisco, Cal	8.6		8.6								8.6			1.5	7.1	
12	Cincinnati, Ohio	5.1		5.1								5.1	1.1			4.0	
13	Milwaukee, Wis	4.6		4.6								4.6	[4] 1.6			[5] 3.0	
14	Newark, N. J	13.1	7.9	4.3	0.9							13.1	0.1		0.4	12.0	0.6
15	New Orleans, La	20.6	20.6			13.7				13.7		6.9				6.9	
16	Washington, D. C	21.0	10.2	10.8		11.1				10.9	0.2	9.9			(1)	9.1	0.8

GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.

City number.	CITY.	Total.	Sanitary.	Combined.	Storm-water.	City employees: Total.	Brick.	Concrete.	Reinforced concrete.	Vitrified pipe.	All other.	Contractors: Total.	Brick.	Concrete.	Reinforced concrete.	Vitrified pipe.	All other.
17	Minneapolis, Minn	16.7	0.6	16.1		16.7	1.5		2.5	12.7							
18	Los Angeles, Cal	97.9	97.9									97.9	2.0			95.9	
19	Jersey City, N. J	2.1		1.1	1.0							2.1	0.5			0.6	1.0
20	Kansas City, Mo	8.4		8.4								8.4	0.8	1.1		6.5	
21	Indianapolis, Ind	29.0	3.0	26.0								29.0	6.5	0.5		19.0	3.0
22	Louisville, Ky	20.8		20.8		5.4	0.1		5.3			15.4			10.8	4.6	
23	Seattle, Wash	35.8		35.8								35.8	0.2		2.4	31.9	1.3
24	Providence, R. I	4.4		4.2	0.2							4.4	1.0			3.4	
25	Rochester, N. Y	3.5		3.5								3.5				3.5	
26	St. Paul, Minn	15.7		15.7								15.7		1.9		13.3	0.5
27	Denver, Colo	36.5	30.0		6.5							36.5	2.8			33.7	
28	Portland, Oreg	8.3		8.3								8.3	2.6			5.7	
29	Columbus, Ohio	12.9	12.7		0.2							12.9	0.2			11.4	1.3
30	Toledo, Ohio	7.2		7.2								7.2	1.8			5.4	
31	Worcester, Mass	4.5	2.6	0.7	1.2	4.5			0.2	4.3							
32	Atlanta, Ga	8.7		8.7								8.7	0.5	0.3		7.9	
33	Syracuse, N. Y	6.5		6.5								6.5	0.8	0.9		[5] 4.8	
34	New Haven, Conn	1.9		1.9								1.9	0.3		0.3	[5] 1.3	
35	Scranton, Pa	2.6		2.6								2.6				2.6	
36	Paterson, N. J	1.0		1.0								1.0				1.0	
37	Omaha, Nebr	7.6	1.9	5.7		0.6				0.6		7.0	1.6	0.2		5.2	
38	Fall River, Mass	1.3		1.3		1.3	0.2			1.1							
39	Memphis, Tenn	10.4	10.4			10.4				10.4							
40	Richmond, Va	6.3		6.3								6.3	0.9			5.4	
41	Oakland, Cal	10.8	7.5	2.1	1.2							10.8		2.7	0.8	7.3	
42	Grand Rapids, Mich	8.4		8.4								8.4		0.1	0.4	7.1	0.8
43	Nashville, Tenn	7.9		7.9								7.9	0.2			7.7	
44	Lowell, Mass	1.9		1.9		1.9				1.9							
45	Cambridge, Mass	4.5	4.2	(1)	0.3	4.5				4.2	0.3						
46	Dayton, Ohio	11.2	7.0		4.2							11.2		1.5		9.7	

[1] Less than one-tenth of 1 mile.
[2] Included with combined sewers.
[3] Includes mileage of sanitary and storm-water sewers.
[4] Includes mileage of some concrete sewers.
[5] Includes mileage of some cement pipe sewers.

TABLE 3.—SEWERS—MILEAGE BUILT DURING YEAR: 1909—Continued.

[Cities not reporting sewers built during year are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 24.]

City number.	CITY.	Total.	CLASSIFIED BY CHARACTER.			CLASSIFIED BY BUILDER.											
						City employees.						Contractors.					
			Sanitary.	Combined.	Storm-water.	Total.	Brick.	Concrete.	Reinforced concrete.	Vitrified pipe.	All other.	Total.	Brick.	Concrete.	Reinforced concrete.	Vitrified pipe.	All other.
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.																
47	Albany, N. Y	3.1		3.1								3.1				3.1	
48	Bridgeport, Conn	1.9		1.9								1.9					1.9
49	Spokane, Wash	15.6		15.6								15.6				15.6	
50	Hartford, Conn	1.7		1.3	0.4							1.7	0.2	0.7		0.8	
52	Trenton, N. J	2.6	2.6									2.6		0.1		2.5	(1)
53	San Antonio, Tex	3.0	3.0									3.0				3.0	
54	New Bedford, Mass	5.0		4.8	0.2	5.0			0.6	4.4							
55	Camden, N. J	4.3		4.3								4.3	4.3				
56	Dallas, Tex	8.0	6.8		1.2							8.0				8.0	
57	Salt Lake City, Utah	17.1	16.6		0.5							17.1			2.5	14.6	
58	Lynn, Mass	1.1		1.1		1.1			0.1	1.0							
59	Wilmington, Del	4.1		4.1		4.1	(1)	0.1		3.3	0.7						
60	Springfield, Mass	3.5	0.6	2.9		3.5		0.7		2.8							
61	Des Moines, Iowa	10.1	0.9	9.2								10.1		0.7		9.4	
62	Lawrence, Mass	2.4	0.7	1.5	0.2	1.9				1.9		0.5				0.5	
63	St. Joseph, Mo	5.8		5.8								5.8		1.1		4.7	
64	Troy, N. Y	0.6		0.6								0.6				0.6	
65	Yonkers, N. Y	1.1	0.2	0.7	0.2							1.1				1.1	(1)
66	Tacoma, Wash	31.4	25.6		5.8							31.4			(1)	31.4	
67	Youngstown, Ohio	5.3		5.3								5.3	0.4			4.9	
68	Duluth, Minn	6.5	5.7		0.8							6.5		1.1		5.4	(1)
69	Houston, Tex	1.8	1.5		0.3							1.8			0.3	1.5	
70	Somerville, Mass	1.7	1.3	0.3	0.1							1.7				1.7	
71	Kansas City, Kans	15.8		15.8								15.8	2.0			13.8	
72	Utica, N. Y	2.6		1.0	1.6							2.6	0.1			2.5	(1)
73	Waterbury, Conn	1.3	0.7		0.6							1.3				1.3	
74	Elizabeth, N. J	4.4		4.4								4.4				4.4	
75	Schenectady, N. Y	2.9	2.2		0.7							2.9				2.9	
76	Hoboken, N. J	1.3		1.3								1.3	0.8				0.5
77	Manchester, N. H	1.4		1.4		1.4				1.4							
78	Evansville, Ind	6.4		6.4								6.4			1.7	4.7	
79	Birmingham, Ala	11.0	10.1		0.9							11.0	1.9			9.1	
80	Akron, Ohio	5.6	5.0		0.6							5.6	0.3		0.3	5.0	
81	Norfolk, Va	16.1	14.0		2.1	0.5			0.5			15.6				15.6	
82	Fort Worth, Tex	21.5	20.0		1.5	3.0				3.0		18.5			1.5	17.0	
83	Wilkes-Barre, Pa	4.7		4.7		0.3				0.3		4.4				4.4	
84	Erie, Pa	2.3		2.3								2.3				2.3	
85	Savannah, Ga	0.8			0.8	0.8				0.8							
86	Peoria, Ill	11.6		11.6								11.6	11.3			0.3	
87	Harrisburg, Pa	4.8		4.8								4.8	3.7			1.1	
88	Fort Wayne, Ind	4.4		4.4								4.4	0.9			3.5	
89	Charleston, S. C	0.6			0.6							0.6				0.6	
90	Portland, Me	3.0	2.7	0.3								3.0				3.0	
91	Terre Haute, Ind	1.4		1.4								1.4	1.4				
92	East St. Louis, Ill	0.9		0.9								0.9				0.9	
93	Holyoke, Mass	1.2		0.7	0.5	1.2				1.2							
94	Brockton, Mass	5.5	4.7		0.8	5.5				5.5	(1)						
95	Johnstown, Pa	1.0		1.0								1.0				1.0	
96	Jacksonville, Fla	4.9	3.4		1.5							4.9	1.5			3.4	
97	Oklahoma City, Okla	35.6	23.5	0.6	11.5							35.6		6.6		29.0	
98	Bayonne, N. J	1.9		1.9								1.9				1.9	
99	Covington, Ky	1.6		1.6								1.6		0.2		1.4	
100	South Bend, Ind	1.4		1.4								1.4				1.4	
101	Passaic, N. J	3.5		3.5								3.5				3.5	
102	Altoona, Pa	1.1	1.1		(1)							1.1				1.1	
103	Mobile, Ala	0.2	0.2			0.2				0.2							
104	Allentown, Pa	1.5			1.5							1.5				1.5	
105	Pawtucket, R. I	2.0		2.0		1.3	0.1	(1)		1.2		0.7	(1)	0.6		0.1	

[1] Less than one-tenth of 1 mile.

TABLE 3.—SEWERS—MILEAGE BUILT DURING YEAR: 1909—Continued.

[Cities not reporting sewers built during year are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 24.]

GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,600 IN 1909.

City number.	CITY.	Total.	CLASSIFIED BY CHARACTER.			CLASSIFIED BY BUILDER.											
						City employees.						Contractors.					
			Sanitary.	Combined.	Storm-water.	Total.	Brick.	Concrete.	Reinforced concrete.	Vitrified pipe.	All other.	Total.	Brick.	Concrete.	Reinforced concrete.	Vitrified pipe.	All other.
106	Saginaw, Mich	2.4		2.4								2.4				2.4	
107	Canton, Ohio	8.8	5.8		3.0							8.8				8.8	
108	Wichita, Kans	31.8	2.7		29.1							31.8	11.0			20.8	
109	Springfield, Ill	1.2		1.2								1.2				1.2	
110	Binghamton, N. Y	4.1		3.0	1.1							4.1			0.1	4.0	
111	Lancaster, Pa	8.0		8.0								8.0	4.8		0.2	3.0	
112	Sioux City, Iowa	8.3	6.7		1.6							8.3	0.3			8.0	
113	Little Rock, Ark	8.0	8.0									8.0				8.0	
114	Springfield, Ohio	14.7	14.7									14.7				14.7	
116	Bay City, Mich	2.2		2.2								2.2			1.0	1.2	
117	Rockford, Ill	2.4	2.4									2.4				2.4	
118	York, Pa	2.0	1.0		1.0							2.0	0.2			1.8	
119	Lincoln, Nebr	5.3	5.3									5.3				5.3	
120	Chattanooga, Tenn	1.1		1.1								1.1	0.8			0.3	
121	Topeka, Kans	4.3		4.3								4.3		1.0		3.3	
122	Sacramento, Cal	9.8		9.8								9.8		0.9	1.9	7.0	
123	Malden, Mass	2.6	1.8		0.8	1.4				1.4		1.2		0.3		0.9	
124	Haverhill, Mass	0.4		0.1	0.3	0.4	(1)			0.4							
125	Pueblo, Colo	3.9	2.5	1.4								3.9				3.9	
126	Salem, Mass	4.0		4.0		4.0			0.2	3.5	0.3						
127	New Britain, Conn	5.9	5.0		0.9	5.9		1.1		4.8							
128	Davenport, Iowa	1.9		0.8	1.1	1.2	0.5			0.7		0.7				0.7	
129	McKeesport, Pa	0.1			0.1							0.1				0.1	
130	Wheeling, W. Va	0.6		0.6								0.6				0.6	
131	Augusta, Ga	2.0		2.0								2.0				2.0	
132	Superior, Wis	0.6		0.6								0.6				0.6	
133	Newton, Mass	2.3	1.8		0.5	2.3				2.3							
134	Dubuque, Iowa	0.6	0.5		0.1							0.6		(1)		0.5	0.1
135	Butte, Mont	0.2	0.1		0.1							0.2				0.2	
136	Chester, Pa	0.2		0.2								0.2					0.2
137	Kalamazoo, Mich	5.3	2.7		2.6	5.3		1.5		3.8							
138	Montgomery, Ala	5.3	2.9		2.4							5.3					5.3
139	Woonsocket, R. I	0.2	0.2									0.2				0.2	
140	Galveston, Tex	7.0	5.0		2.0							7.0		1.5		5.5	
141	Fitchburg, Mass	2.1		2.1		2.1				2.1							
142	Racine, Wis	0.6		0.6								0.6	0.2			0.4	
143	Elmira, N. Y	2.1		2.1		1.5				1.5		0.6				0.6	
144	Quincy, Ill	0.7		0.7								0.7				0.7	
145	Knoxville, Tenn	8.8	3.5		5.3	0.7				0.7		8.1		0.1		8.0	
146	New Castle, Pa	2.9	2.5		0.4							2.9				2.9	
148	Auburn, N. Y	16.1	0.4	15.5	0.2							16.1				16.1	
149	West Hoboken, N. J	0.2		0.2								0.2				0.2	
150	Joliet, Ill	1.2		1.2								1.2				1.2	
151	Taunton, Mass	1.4	1.4			1.4				1.4							
152	Everett, Mass	0.4	0.4			0.4				0.4							
153	Oshkosh, Wis	2.8		2.8								2.8		(1)		2.7	0.1
155	Joplin, Mo	1.6	1.5		0.1							1.6		0.1		1.5	
156	La Crosse, Wis	2.9		2.9								2.9			0.4	2.5	
157	Newport, Ky	0.6		0.6								0.6	0.2			0.4	(1)
158	South Omaha, Nebr	1.7		1.7								1.7		1.3		0.4	

[1] Less than one-tenth of 1 mile.

TABLE 4.—SEWERS—EMPLOYEES AND EXPENSES OF OPERATION AND MAINTENANCE: 1909.

PART I.—CITIES HAVING NO CITY EMPLOYEES ENGAGED ON SEWER CONSTRUCTION WORK.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 27. Figures printed in italics are estimates.]

City number.	CITY.	Total mileage of sewers.	AVERAGE NUMBER OF EMPLOYEES.									EXPENSES OF OPERATION AND MAINTENANCE.		
			All classes.			Superintendents and engineers.	Foremen and inspectors.	Mechanics and skilled laborers.	Teamsters.	Unskilled laborers.	All others.	Total.	Per mile of sewer.	Per 1,000 population served.
			Total.	Per 10 miles of sewers.	Per 10,000 population served.									
	Grand total	17,925.1	4,524	2.3	3.1	778	758	358	491	1,908	231	$3,917,679	$223.88	$251.22
	Group I	7,325.3	2,573	2.5	2.8	462	439	191	277	1,019	185	2,570,578	350.92	274.80
	Group II	4,715.3	774	1.6	2.7	107	144	74	79	348	22	602,442	137.99	215.06
	Group III	3,650.3	725	2.4	3.7	119	103	57	101	333	12	503,462	139.12	212.81
	Group IV	2,234.2	452	2.4	5.0	90	72	36	34	208	12	241,197	110.08	221.80
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.													
1	New York, N. Y	1,907.9	1,305	6.8	3.0	224	231	48	185	562	55	[1] $1,410,173	$739.14	$320.22
	Bronx Borough	283.3	284	10.0	7.1	67	63	6	45	82	21	(2)	(2)	(2)
	Brooklyn Borough	830.3	448	5.4	3.2	77	64	20	65	202	20	(2)	(2)	(2)
	Manhattan Borough	523.3	296	5.7	1.3	17	49	13	64	145	8	(2)	(2)	(2)
	Queens Borough	196.0	184	9.3	12.3	39	37	9	2	92	5	(2)	(2)	(2)
	Richmond Borough	75.0	[3] 93	11.1	18.6	[4] 24	18	....	9	41	1	(2)	(2)	(2)
3	Philadelphia, Pa	1,185.1	262	2.2	1.9	76	89	6	....	....	91	163,580	138.03	116.84
4	St. Louis, Mo	649.0	217	3.3	4.7	30	35	3	24	116	9	198,472	305.81	339.27
7	Cleveland, Ohio	529.2	125	2.4	2.4	13	29	3	14	56	10	64,074	121.07	121.73
8	Pittsburgh, Pa	542.2	[3] 34	0.6	0.7	3	3	6	8	14	(5)	50,245	92.67	100.49
9	Detroit, Mich	631.6	32	0.5	0.7	23	....	....	....	9	....	[6] 55,902	88.51	125.69
10	Buffalo, N. Y	507.0	97	1.9	2.5	39	18	6	3	23	8	[6] 49,848	98.33	130.94
11	San Francisco, Cal	358.9	215	6.0	6.5	16	14	13	25	141	6	257,007	716.16	778.81
12	Cincinnati, Ohio	326.0	75	2.3	2.6	4	7	32	4	28	....	66,295	203.33	225.86
13	Milwaukee, Wis	419.4	155	3.7	4.4	28	8	50	9	57	3	[6] 142,294	339.31	406.55
14	Newark, N. J	269.0	56	2.5	2.2	6	5	24	5	13	3	[6] 112,688	418.88	432.65
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.													
18	Los Angeles, Cal	439.0	50	1.1	2.4	8	17	....	3	21	1	$28,246	$64.34	$137.79
19	Jersey City, N. J	126.5	[3] 24	1.9	1.1	2	2	....	[4] 3	17	....	42,288	334.40	192.22
20	Kansas City, Mo	354.5	[3] 32	0.9	1.5	6	7	2	3	14	(5)	[7] 683	1.93	3.21
21	Indianapolis, Ind	257.3	53	2.1	2.4	3	20	6	7	17	....	39,901	155.08	177.34
23	Seattle, Wash	247.2	[3] 31	1.3	2.1	(5)	4	....	3	24	....	26,433	106.91	176.22
24	Providence, R. I	228.6	[3] 136	5.9	7.0	[4] 15	12	11	23	74	1	[1] 131,591	575.74	678.30
25	Rochester, N. Y	266.0	[3] 106	4.0	5.0	[8] 41	[8] 45	5	3	2	10	19,285	72.50	91.83
26	St. Paul, Minn	281.4	43	1.5	5.1	2	4	4	6	27	....	[1] 31,331	111.34	368.60
27	Denver, Colo	429.3	[3] 26	0.6	1.7	(5)	2	....	3	18	3	25,229	58.77	168.19
28	Portland, Oreg	189.0	(5)	....	....	(5)	(5)	(5)	(5)	(5)	(5)	36,673	194.01	209.56
29	Columbus, Ohio	207.3	61	2.9	4.1	10	2	16	2	25	6	[1] 50,735	244.69	338.23
30	Toledo, Ohio	231.4	[3] 9	0.4	0.6	(5)	1	5	(5)	3	(5)	9,947	42.99	66.31
32	Atlanta, Ga	161.2	[3] 27	1.7	3.4	2	1	5	(5)	19	....	13,944	86.50	174.30
33	Syracuse, N. Y	164.8	8	0.5	0.7	2	....	....	(5)	6	....	22,214	134.79	183.59
34	New Haven, Conn	116.0	24	2.1	2.4	2	4	....	3	15	....	20,248	174.63	202.48
35	Scranton, Pa	110.9	[3] 19	1.7	2.2	(5)	1	....	6	12	....	21,756	196.12	255.95
36	Paterson, N. J	84.6	21	2.5	2.2	4	3	2	2	9	1	11,165	132.05	116.30
40	Richmond, Va	106.8	[3] 21	2.0	2.2	[4] 1	6	....	....	14	....	17,113	160.25	178.26
41	Oakland, Cal	239.0	33	1.4	3.1	2	8	10	4	9	....	23,631	98.87	223.86
42	Grand Rapids, Mich	178.5	[3] 32	1.8	4.0	2	3	6	6	15	(5)	[6] 17,628	98.73	220.35
43	Nashville, Tenn	98.5	[3] 1	0.1	0.1	(5)	1	....	....	....	....	383	3.89	5.47
46	Dayton, Ohio	197.5	[3] 17	0.9	3.4	[4] 5	1	2	2	7	....	[6] 12,018	60.86	237.74

---

[1] Includes expenses of pumping and purification.
[2] Not reported.
[3] Incomplete.
[4] Some employees engaged on sewer work reported with employees of another department.
[5] Reported with employees of another department.
[6] Includes expenses of pumping.
[7] Part of expenses of sewers is included with those of street cleaning.
[8] These employees are also in charge of all highway work.

Table 4.—SEWERS—EMPLOYEES AND EXPENSES OF OPERATION AND MAINTENANCE: 1909—Continued.

PART I.—CITIES HAVING NO CITY EMPLOYEES ENGAGED ON SEWER CONSTRUCTION WORK—Continued.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 27. Figures printed in italics are estimates.]

City number.	CITY.	Total mileage of sewers.	AVERAGE NUMBER OF EMPLOYEES. All classes. Total.	All classes. Per 10 miles of sewers.	All classes. Per 10,000 population served.	Superintendents and engineers.	Foremen and inspectors.	Mechanics and skilled laborers.	Teamsters.	Unskilled laborers.	All others.	EXPENSES OF OPERATION AND MAINTENANCE. Total.	Per mile of sewer.	Per 1,000 population served.
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.													
47	Albany, N. Y.	101.4	16	1.6	1.7	2	....	4	2	8	....	$11,531	$113.72	$120.25
48	Bridgeport, Conn.	91.0	[1]9	1.0	1.0	(2)	2	....	1	6	(2)	9,500	104.40	105.56
49	Spokane, Wash.	63.6	[1]8	1.3	1.6	(2)	[3]1	....	[3]2	[3]5	....	7,056	111.01	141.12
50	Hartford, Conn.	116.6	[1]12	1.0	1.2	[3]1	1	1	7	2	....	[4]15,574	133.57	160.56
51	Reading, Pa.	115.8	[1]14	1.2	1.9	(2)	1	....	1	12	....	[5]57,658	497.78	800.81
52	Trenton, N. J.	91.3	9	1.0	1.5	3	1	....	3	2	....	6,489	71.09	108.15
53	San Antonio, Tex.	98.9	10	1.0	1.5	5	3	2	....	....	....	9,840	99.49	145.78
55	Camden, N. J.	70.8	7	1.0	1.6	2	1	....	1	3	....	5,008	70.69	111.29
56	Dallas, Tex.	131.2	11	0.8	2.3	3	2	[1]4	....	2	....	5,642	42.99	115.73
57	Salt Lake City, Utah	124.7	29	2.3	4.5	13	3	4	3	6	....	[4]21,396	171.58	329.17
61	Des Moines, Iowa	119.0	109	9.1	18.2	5	15	9	25	55	....	[6]15,932	133.83	265.53
63	St. Joseph, Mo.	93.6	20	2.1	2.8	7	5	1	2	4	1	10,604	113.34	150.09
64	Troy, N. Y.	54.2	13	2.4	1.9	6	1	....	....	4	2	11,119	205.07	158.84
65	Yonkers, N. Y.	48.6	[1]6	1.2	1.0	(2)	1	....	2	3	(2)	4,502	92.71	75.03
66	Tacoma, Wash.	202.8	[1]19	0.9	3.1	(2)	5	....	2	12	(2)	17,729	87.41	291.60
67	Youngstown, Ohio	92.2	13	1.4	2.2	1	8	....	4	....	....	10,170	110.36	169.50
68	Duluth, Minn.	101.6	26	2.6	4.6	10	3	....	1	11	1	15,545	153.00	272.72
69	Houston, Tex.	63.2	20	3.2	6.2	2	2	4	1	11	....	[5]23,641	374.36	729.66
70	Somerville, Mass.	100.3	[1]16	1.6	2.1	2	1	3	4	6	(2)	35,084	349.90	462.67
71	Kansas City, Kans.	74.3	[1]9	1.2	1.4	(2)	4	....	....	5	(2)	3,275	44.05	49.25
72	Utica, N. Y.	88.8	9	1.0	1.2	2	1	....	1	4	1	6,551	73.75	90.99
73	Waterbury, Conn.	53.6	34	6.3	7.6	2	1	....	2	28	1	18,069	336.79	401.53
74	Elizabeth, N. J.	71.3	12	1.7	1.8	2	1	....	2	7	....	6,297	88.28	96.88
75	Schenectady N. Y.	96.3	16	1.7	2.4	1	2	1	2	10	....	11,857	123.18	174.37
76	Hoboken, N. J.	19.4	6	3.1	1.2	....	1	....	....	5	....	11,474	592.36	220.19
78	Evansville Ind.	42.2	[1]7	1.7	3.0	(2)	3	....	(2)	4	(2)	3,489	82.60	151.70
79	Birmingham, Ala.	96.2	9	0.9	2.0	1	1	....	1	6	....	7,122	74.06	158.27
80	Akron, Ohio	108.4	14	1.3	3.5	....	3	....	1	10	....	[6]10,918	100.72	272.95
84	Erie, Pa.	81.8	[1]6	0.7	1.0	[3]1	1	....	1	2	1	3,058	37.41	50.97
86	Peoria, Ill.	96.9	[1]13	1.3	2.2	5	2	2	1	3	(2)	7,912	81.67	131.87
87	Harrisburg, Pa.	63.4	8	1.3	1.6	1	1	....	3	3	....	20,093	316.77	401.86
88	Fort Wayne, Ind.	90.0	14	1.6	3.3	4	1	....	3	5	1	4,456	49.51	106.10
89	Charleston, S. C.	70.5	[1]14	1.9	9.3	(2)	....	8	3	8	....	[4]8,416	119.38	561.07
90	Portland, Me.	71.9	[1]9	1.3	(7)	5	....	....	2	2	....	19,328	268.86	....
91	Terre Haute, Ind.	56.9	11	1.9	3.1	7	....	....	1	2	1	6,050	106.38	172.86
92	East St. Louis, Ill.	51.0	27	5.3	6.0	4	5	7	3	7	1	[4]14,289	280.18	317.53
95	Johnstown, Pa.	38.0	[1]12	3.2	4.0	(2)	....	....	2	10	....	6,419	168.92	213.97
96	Jacksonville, Fla.	73.3	13	1.8	3.3	1	1	1	2	8	....	[4]16,772	228.84	419.30
97	Oklahoma City, Okla.	145.6	23	1.6	7.6	3	7	11	....	2	....	5,617	38.58	160.49
98	Bayonne, N. J.	31.5	16	5.1	5.0	5	1	....	1	9	....	(7)	....	....
99	Covington, Ky.	54.8	15	2.7	4.3	2	3	....	2	8	....	6,389	116.52	182.54
100	South Bend, Ind.	61.3	32	5.2	11.4	8	5	....	2	15	2	173	2.82	6.18
101	Passaic, N. J.	45.6	11	2.4	2.8	1	1	....	2	7	....	4,724	103.51	118.10
102	Altoona, Pa.	73.8	[1]14	1.9	3.1	2	1	....	2	9	(2)	[6]6,329	85.76	140.64
104	Allentown, Pa.	12.7	[1]4	3.1	80.0	(2)	1	....	1	2	....	365	28.74	730.00

---

[1] Incomplete.
[2] Reported with employees of another department.
[3] Some employees engaged on sewer work reported with employees of another department.
[4] Includes expenses of pumping.
[5] Includes expenses of pumping and purification.
[6] Includes expenses of purification.
[7] Not reported.

TABLE 4.—SEWERS—EMPLOYEES AND EXPENSES OF OPERATION AND MAINTENANCE: 1909—Continued.

PART I.—CITIES HAVING NO CITY EMPLOYEES ENGAGED ON SEWER CONSTRUCTION WORK—Continued.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 27. Figures printed in italics are estimates.]

City number.	CITY.	Total mileage of sewers.	AVERAGE NUMBER OF EMPLOYEES.									EXPENSES OF OPERATION AND MAINTENANCE.		
			All classes.			Superintendents and engineers.	Foremen and inspectors.	Mechanics and skilled laborers.	Teamsters.	Unskilled laborers.	All others.	Total.	Per mile of sewer.	Per 1,000 population served.
			Total.	Per 10 miles of sewers.	Per 10,000 population served.									
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.													
106	Saginaw, Mich	94.3	85	9.0	18.9	7	3	2	4	64	5	[1] $3,473	$36.82	$77.18
107	Canton, Ohio	97.6	17	1.7	5.3	4	6	....	3	4	....	[2] 8,929	91.46	279.03
108	Wichita, Kans	126.4	15	1.2	5.0	6	2	....	1	5	1	7,517	59.49	230.57
109	Springfield, Ill	61.5	13	2.1	6.5	2	3	....	1	7	....	8,596	139.78	429.75
110	Binghamton, N. Y	52.7	16	3.0	4.0	3	4	1	2	5	1	7,668	145.48	191.70
111	Lancaster, Pa	43.0	[3] 17	4.0	4.7	(4)	1	....	1	15	....	(5)	....	....
112	Sioux City, Iowa	77.8	14	1.8	6.4	4	1	1	2	6	....	[1] 11,720	150.57	532.73
113	Little Rock, Ark	64.0	[3] 4	0.6	1.1	(4)	1	1	....	2	....	[2] 2,004	31.31	52.74
114	Springfield, Ohio	31.6	[3] 6	1.9	3.3	1	....	2	(4)	3	....	4,691	145.37	255.61
116	Bay City, Mich	103.1	15	1.4	5.0	3	6	6	....	....	....	4,104	39.81	136.80
117	Rockford, Ill	55.1	14	2.5	5.0	3	1	....	1	8	1	9,917	180.11	356.21
119	Lincoln, Nebr	61.9	19	3.1	5.4	6	3	....	1	8	1	7,573	122.42	216.37
120	Chattanooga, Tenn	74.2	12	1.6	3.2	4	3	....	1	3	1	3,663	49.37	96.39
121	Topeka, Kans	*87.4*	15	1.7	6.0	6	6	....	1	2	....	1,400	16.02	56.00
122	Sacramento, Cal	64.9	[3] 20	3.1	5.7	[6] 1	2	10	2	5	....	[1] 33,800	520.72	965.71
125	Pueblo, Colo	89.4	11	1.2	3.1	6	3	....	....	2	....	6,760	75.57	193.14
129	McKeesport, Pa	33.2	10	3.0	2.9	3	1	2	1	3	....	10,898	328.65	311.37
130	Wheeling, W. Va	43.8	12	2.7	3.0	1	1	....	1	9	....	6,458	147.61	161.45
131	Augusta, Ga	63.5	[3] 5	0.8	1.4	(4)	(4)	(4)	(4)	5	....	3,413	53.73	97.51
132	Superior, Wis	56.6	10	1.8	3.1	2	1	....	1	4	2	15,807	279.32	493.97
134	Dubuque, Iowa	41.4	3	0.7	1.0	3	....	....	....	....	....	6,479	156.35	223.41
135	Butte, Mont	33.9	7	2.0	2.3	2	....	....	1	4	....	4,662	137.64	155.40
136	Chester, Pa	32.5	[3] 5	1.5	2.0	(4)	....	1	1	3	....	7,095	218.04	283.80
138	Montgomery, Ala	89.7	[3] 7	0.8	2.3	(4)	2	....	1	4	....	1,990	22.19	66.33
139	Woonsocket, R. I	18.5	[3] 6	3.2	3.2	1	....	2	(4)	3	....	[7] 12,047	651.19	634.05
140	Galveston, Tex	36.8	10	2.7	3.1	2	2	2	1	8	....	8,648	234.87	266.91
142	Racine, Wis	67.2	(4)	....	....	(4)	(4)	....	(4)	(4)	(4)	3,247	48.30	108.23
144	Quincy, Ill	34.7	9	2.6	6.0	2	5	2	....	....	....	1,448	41.73	96.53
146	New Castle, Pa	62.3	6	1.0	2.0	2	1	....	1	2	....	4,615	74.07	153.83
147	Macon, Ga	*73.9*	[3] 13	1.8	4.3	(4)	1	2	....	10	(4)	3,899	52.78	129.97
148	Auburn, N. Y	*85.9*	[3] 9	1.0	3.2	(4)	7	....	1	1	(4)	[2] 2,532	29.48	90.43
149	West Hoboken, N. J	20.2	[3] 3	1.5	1.0	(4)	(4)	....	....	3	....	1,816	90.08	60.53
150	Joliet, Ill	35.0	13	3.7	6.5	8	....	....	1	4	....	2,195	62.71	109.75
153	Oshkosh, Wis	73.0	(4)	....	....	(4)	(4)	(4)	(4)	(4)	(4)	1,017	13.93	36.98
154	Chelsea, Mass	37.3	[3] 5	1.3	1.6	(4)	....	....	2	3	(4)	15,609	418.47	487.78
155	Joplin, Mo	32.4	5	1.5	2.5	2	1	2	....	....	....	40	1.23	2.00
156	La Crosse, Wis	28.9	[3] 2	0.7	1.1	(5)	....	....	....	2	....	1,481	51.32	82.28
157	Newport, Ky	27.6	11	4.0	7.3	2	1	....	2	6	....	2,427	87.81	161.80
158	South Omaha, Nebr	21.0	[3] 8	3.8	13.3	4	4	....	(4)	(4)	....	1.650	78.57	275.00

---

[1] Includes expenses of pumping.
[2] Includes expenses of purification.
[3] Incomplete.
[4] Reported with employees of another department.
[5] Not reported.
[6] Some employees engaged on sewer work reported with employees of another department.
[7] Includes expenses of pumping and purification.

TABLE 4.—SEWERS—EMPLOYEES AND EXPENSES OF OPERATION AND MAINTENANCE: 1909—Continued.

PART II.—CITIES HAVING CITY EMPLOYEES ENGAGED ON SEWER CONSTRUCTION WORK.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 27. Figures printed in italics are estimates.]

City number.	CITY.	Total mileage of sewers.	AVERAGE NUMBER OF EMPLOYEES. All classes. Total.	All classes. Per 10 miles of sewers.	All classes. Per 10,000 population served.	Superintendents and engineers.	Foremen and inspectors.	Mechanics and skilled laborers.	Teamsters.	Unskilled laborers.	All others.	EXPENSES OF OPERATION AND MAINTENANCE. Total.	Per mile of sewers.	Per 1,000 population served.
	Grand total	7,040.1	4,775	....	....	211	364	571	346	3,203	80	$2,174,582	$308.88	$431.23
	Group I	3,687.7	2,073	....	....	116	196	358	215	1,138	50	1,559,799	422.98	523.69
	Group II	1,379.1	1,374	....	....	48	104	134	47	1,021	20	295,064	213.95	335.09
	Group III	1,180.9	897	....	....	24	42	45	63	715	8	196,143	166.11	248.42
	Group IV	792.4	431	....	....	23	22	34	21	329	2	123,576	155.95	356.94

GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.

City number.	CITY.	Total mileage of sewers.	Total.	Per 10 miles of sewers.	Per 10,000 population served.	Superintendents and engineers.	Foremen and inspectors.	Mechanics and skilled laborers.	Teamsters.	Unskilled laborers.	All others.	Total.	Per mile of sewers.	Per 1,000 population served.
2	Chicago, Ill	1,837.0	387	....	....	4	45	79	52	196	11	[2] $796,701	$433.70	$455.26
5	Boston, Mass	765.6	616	....	....	67	50	89	22	368	20	[3] 374,383	488.97	571.58
6	Baltimore, Md	77.4	605	....	....	17	56	119	69	333	11	90,836	1,174.20	....
15	New Orleans, La	464.3	147	....	....	9	22	30	26	60	....	[3] 121,463	261.62	1,214.63
16	Washington, D. C	543.4	318	....	....	19	23	41	46	181	8	[3] 176,416	324.66	588.05

GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.

City number.	CITY.	Total mileage of sewers.	Total.	Per 10 miles of sewers.	Per 10,000 population served.	Superintendents and engineers.	Foremen and inspectors.	Mechanics and skilled laborers.	Teamsters.	Unskilled laborers.	All others.	Total.	Per mile of sewers.	Per 1,000 population served.
17	Minneapolis, Minn	257.4	496	....	....	5	36	54	21	377	3	$59,110	$229.64	$402.11
22	Louisville, Ky	152.3	179	....	....	14	21	20	6	112	6	22,193	145.68	170.72
31	Worcester, Mass	192.3	279	....	....	2	13	13	4	243	4	[2] 81,468	423.74	644.02
37	Omaha, Nebr	182.4	65	....	....	15	11	5	3	27	4	[4] 37,731	206.90	377.31
38	Fall River, Mass	71.4	111	....	....	2	5	4	4	96	....	14,924	209.02	179.76
39	Memphis, Tenn	277.2	64	....	....	1	5	2	1	55	....	[2] 10,703	38.61	104.91
44	Lowell, Mass	105.5	[5] 104	....	....	[6] 5	10	30	5	54	(7)	12,101	114.67	127.38
46	Cambridge, Mass	140.6	76	....	....	4	3	6	3	57	3	56,834	404.11	585.92

GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.

City number.	CITY.	Total mileage of sewers.	Total.	Per 10 miles of sewers.	Per 10,000 population served.	Superintendents and engineers.	Foremen and inspectors.	Mechanics and skilled laborers.	Teamsters.	Unskilled laborers.	All others.	Total.	Per mile of sewers.	Per 1,000 population served.
54	New Bedford, Mass	87.9	[5] 85	....	....	(7)	2	10	6	67	....	$24,511	$278.98	$272.34
58	Lynn, Mass	78.1	44	....	....	2	3	1	8	34	1	[2] 12,754	163.35	154.02
59	Wilmington, Del	96.9	141	....	....	3	5	2	12	119	....	9,299	95.96	154.98
60	Springfield, Mass	118.8	48	....	....	1	1	....	2	44	....	17,238	145.10	210.22
62	Lawrence, Mass	69.8	[5] 69	....	....	(7)	2	1	7	59	(7)	25,613	367.11	320.16
77	Manchester, N. H	84.4	243	....	....	3	6	7	9	214	4	5,733	67.90	95.55
81	Norfolk, Va	90.7	[5] 39	....	....	[6] 4	6	11	2	16	(7)	[2] 34,394	379.21	818.90
82	Fort Worth, Tex	*119.0*	28	....	....	2	4	....	9	13	....	6,765	56.85	145.55
83	Wilkes-Barre, Pa	73.0	24	....	....	4	2	2	....	15	1	8,906	121.95	178.12
85	Savannah, Ga	77.0	14	....	....	1	1	2	1	9	....	9,050	117.53	226.25
93	Holyoke, Mass	45.4	[5] 27	....	....	(7)	1	....	3	23	(7)	4,451	98.13	80.93
94	Brockton, Mass	73.9	67	....	....	2	3	4	1	55	2	[2] 17,076	231.04	426.90
103	Mobile, Ala	108.9	[5] 6	....	....	[6] 1	1	....	2	2	....	5,599	51.41	149.31
105	Pawtucket, R. I	57.1	62	....	....	1	5	5	6	45	....	[4] 14,754	258.52	368.85

GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.

City number.	CITY.	Total mileage of sewers.	Total.	Per 10 miles of sewers.	Per 10,000 population served.	Superintendents and engineers.	Foremen and inspectors.	Mechanics and skilled laborers.	Teamsters.	Unskilled laborers.	All others.	Total.	Per mile of sewers.	Per 1,000 population served.
123	Malden, Mass	73.1	24	....	....	5	1	2	(7)	15	1	$12,953	$177.10	$385.51
124	Haverhill, Mass	45.9	[5] 8	....	....	(7)	1	....	....	7	(7)	3,277	71.36	93.63
126	Salem, Mass	50.8	91	....	....	4	2	5	9	71	....	[3] 11,318	222.75	....
127	New Britain, Conn	86.9	[5] 89	....	....	[6] 1	5	....	2	80	[6] 1	[4] 9,608	110.56	274.51
128	Davenport, Iowa	71.6	[5] 31	....	....	[6] 2	3	2	4	20	....	6,488	90.65	259.52
133	Newton, Mass	164.5	[5] 60	....	....	5	3	15	(7)	37	(7)	41,976	255.22	1,358.45
137	Kalamazoo, Mich	71.7	46	....	....	3	3	8	2	30	....	9,219	128.52	460.95
141	Fitchburg, Mass	40.3	(7)	....	....	(7)	(7)	(7)	(7)	(7)	(7)	4,536	112.58	174.46
143	Elmira, N. Y	49.6	27	....	....	2	2	2	1	20	....	5,276	106.37	150.74
145	Knoxville, Tenn	54.2	(7)	....	....	(7)	(7)	(7)	(7)	(7)	(7)	789	14.56	24.66
151	Taunton, Mass	29.1	44	....	....	1	2	....	1	40	....	6,959	238.89	695.90
152	Everett, Mass	54.7	[5] 11	....	....	(7)	(7)	....	2	9	(7)	11,177	204.44	349.28

---

[1] Less than one-tenth of 1 mile.
[2] Includes expenses of pumping.
[3] Includes expenses of pumping and purification.
[4] Includes expenses of purification.
[5] Incomplete.
[6] Some employees engaged on sewer work reported with employees of another department.
[7] Reported with employees of another department.
[8] Not reported.

TABLE 5.—SEWERS—HOUSE CONNECTIONS: 1909.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 27. Figures printed in italics are estimates.]

City number.	CITY.	Total mileage of sewers.	HOUSE CONNECTIONS. At close of year. Number.	At close of year. Length (miles).	At close of year. Average length (feet).	Made during year. Number.	Made during year. Length (feet).	Made during year. Average cost per foot.	Size (inches).	Number of stoppages.
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.									
1	New York, N. Y.	1,907.9								
	Bronx Borough	283.3	27,257	(1)		1,799	(1)	(1)	4 to 12	(1)
	Brooklyn Borough	830.3	153,782	(1)		4,666	56,500	(1)	6 to 8	(1)
	Manhattan Borough	523.3	*179,200*	(1)		853	(1)	(1)	6 to 12	(1)
	Queens Borough	196.0	(1)	(1)		(1)	(1)	(1)	6	(1)
	Richmond Borough	75.0	(1)	(1)		(1)	(1)	(1)	4 to 6	(1)
2	Chicago, Ill.	1,837.0	264,532	(1)		11,392	(1)	$0.50	6	*2,000*
3	Philadelphia, Pa.	1,185.1	238,096	*1,200.0*	27	9,449	207,900	(1)	(1)	(1)
4	St. Louis, Mo.	649.0	107,435	1,221.0	60	4,165	249,900	*0.75*	6	*1,927*
5	Boston, Mass.	765.6	(1)	(1)		*2,660*	(1)	(1)	6	(1)
6	Baltimore, Md.	77.4	(1)	(1)		918	59,182	(1)	(1)	(1)
7	Cleveland, Ohio	529.2	[2] 111,667	[2] 317.0	[2] 15	[2] 3,412	[2] 51,180	[2] 0.57	4 to 10	(1)
8	Pittsburgh, Pa.	542.2	*47,713*	271.1	30	1,672	*50,160*	0.55	4 to 10	(1)
9	Detroit, Mich.	631.6	(1)	(1)		(1)	(1)	(1)	6	1,400
10	Buffalo, N. Y.	507.0	[2] *74,100*	[2] *238.6*	[2] 17	[2] 281	[2] 4,777	[2] 0.85	6	(1)
11	San Francisco, Cal	358.9	[2] 59,065	[2] 279.7	[2] 25	[2] 2,700	[2] 67,500	[2] 1.14	6	*48*
12	Cincinnati, Ohio	326.0	30,225	298.0	52	1,671	83,550	0.75	6 to 8	
13	Milwaukee, Wis.	419.4	54,154	(1)		1,482	(1)	(1)	6	(1)
14	Newark, N. J.	269.0	[2] 43,410	[2] *131.0*	[2] 16	[2] 1,503	[2] *24,048*	[2] 0.35	4 to 15	90
15	New Orleans, La.	464.3	7,030	40.0	40	2,260	67,800	1.50	4 to 6	(1)
16	Washington, D. C.	543.4	47,000	270.0	30	1,345	40,000	1.25	4 to 6	416
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.									
17	Minneapolis, Minn.	257.4	20,910	*300.0*	76	2,114	150,000	$1.00 to $1.25	6	(1)
18	Los Angeles, Cal.	439.0	*42,500*	241.5	30	11,823	*354,690*	0.30	4 to 6	*200*
19	Jersey City, N. J.	126.5	*35,000*	*160.0*	24	*1,000*	*40,000*	0.40 to 0.75	6 to 12	
20	Kansas City, Mo.	354.5	*31,150*	*354.0*	60	*1,150*	*69,000*	(1)	4 to 6	260
21	Indianapolis, Ind.	257.3	[3] 39,155	[3] 97.3	[3] 13	[3] 3,630	[3] 63,863	[3] 0.40	6	*50*
22	Louisville, Ky.	152.3	*30,000*	(1)		2,205	70,560	0.37	6	*20*
23	Seattle, Wash.	247.2	13,491	153.3	60	2,387	155,155	(1)	4 to 12	(1)
24	Providence, R. I.	228.6	20,790	(1)		554	9,693	0.60	5 to 6	141
25	Rochester, N. Y.	266.0	*45,000*	(1)		1,542	(1)	0.80	5 to 6	*900*
26	St. Paul, Minn.	281.4	20,684	313.0	80	1,718	137,440	0.75	6	*100*
27	Denver, Colo.	429.3	(1)	(1)		1,930	18,745	1.00	6	68
28	Portland, Oreg.	189.0	34,259	486.6	75	1,971	*147,825*	0.50 to 0.60	4 to 6	(1)
29	Columbus, Ohio	207.3	*25,550*	190.0	39	1,505	*60,000*	0.50	6	(1)
30	Toledo, Ohio	231.4	*22,861*	*281.4*	65	*1,600*	*104,000*	0.60	6	123
31	Worcester, Mass.	192.3	15,297	132.3	46	543	27,836	0.50	6 to 8	7
32	Atlanta, Ga.	161.2	19,599	(1)		1,870	193,738	(1)	6	(1)
33	Syracuse, N. Y.	164.8	*24,737*	(1)		(1)	(1)	0.55	6	(1)
34	New Haven, Conn.	116.0	16,500	(1)		474	(1)	0.50	6	(1)
35	Scranton, Pa.	110.9	*15,000*	(1)		(1)	(1)	0.50	6	(1)
36	Paterson, N. J.	84.6	13,500	110.0	43	355	*18,000*	(1)	6	(1)
37	Omaha, Nebr.	182.4	14,806	197.9	71	1,392	104,900	0.40	4 to 12	31
38	Fall River, Mass.	71.4	6,397	(1)		159	(1)	(1)	6	(1)
39	Memphis, Tenn.	277.2	*18,500*	350.0	99	*1,300*	*22,281*	0.40	6	*1,560*
40	Richmond, Va.	106.8	10,875	57.5	28	863	25,890	0.55	6	87
41	Oakland, Cal.	239.0	18,760	92.0	26	1,704	*44,304*	0.23	4 to 5	
42	Grand Rapids, Mich.	178.5	[3] *17,000*	[3] 48.3	[3] 15	[3] 969	[3] 14,490	[3] 0.65	6	72
43	Nashville, Tenn.	98.5	*16,000*	(1)		547	(1)	(1)	6	260
44	Lowell, Mass.	105.5	11,700	(1)		255	8,900	0.50	4 to 6	64
45	Cambridge, Mass.	140.6	15,259	(1)		203	(1)	(1)	6	106
46	Dayton, Ohio	197.5	9,747	55.0	30	1,432	*43,000*	0.45	4 to 5	10

[1] Not reported.

[2] From main to curb line.

[3] From main to property line.

TABLE 5.—SEWERS—HOUSE CONNECTIONS: 1909—Continued.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 27. Figures printed in italics are estimates.]

City number.	CITY.	Total mileage of sewers.	HOUSE CONNECTIONS.							
			At close of year.			Made during year.			Size (inches).	Number of stoppages.
			Number.	Length (miles).	Average length (feet).	Number.	Length (feet).	Average cost per foot.		
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.									
47	Albany, N. Y	101.4	*18,000*	(1)	....	(1)	(1)	(1)	6	(1)
48	Bridgeport, Conn	91.0	*9,104*	(1)	....	204	*5,100*	$0.20	6	(1)
49	Spokane, Wash	63.6	4,528	63.5	74	960	*67,200*	0.75	6	25
50	Hartford, Conn	116.6	*7,107*	(1)	....	107	1,624	0.50	6	65
51	Reading, Pa	115.8	4,582	(1)	....	1,360	(1)	0.50	5	(1)
52	Trenton, N. J	91.3	*2,928*	(1)	....	728	(1)	0.50	4	52
53	San Antonio, Tex	98.9	6,749	127.8	100	657	65,700	0.40	4 to 6	(1)
54	New Bedford, Mass	87.9	9,986	50.0	26	549	20,820	0.54	6	216
55	Camden, N. J	70.8	*15,000*	(1)	....	(1)	(1)	0.50	6	(1)
56	Dallas, Tex	131.2	*10,000*	37.9	20	974	*19,480*	0.15	4 to 6	(1)
57	Salt Lake City, Utah	124.7	5,636	81.0	76	1,294	*92,000*	1.00	4 to 6	(1)
58	Lynn, Mass	78.1	(1)	(1)	....	359	(1)	0.80	5 to 8	151
59	Wilmington, Del	96.9	[2] 12,113	[2] 45.9	[2] 20	[2] 799	[2] 16,000	[2] 0.60	6	(1)
60	Springfield, Mass	118.8	*13,700*	(1)	....	495	12,375	0.35	6 to 8	(1)
61	Des Moines, Iowa	119.0	19,169	72.6	20	1,202	24,040	0.75	6	(1)
62	Lawrence, Mass	69.8	(1)	(1)	....	247	*6,000*	0.50	6	98
63	St. Joseph, Mo	93.6	6,550	*81.0*	65	*1,050*	68,250	0.75	8	200
64	Troy, N. Y	54.2	12,850	(1)	....	73	1,225	0.75	6	(1)
65	Yonkers, N. Y	48.6	*4,035*	(1)	....	152	(1)	(1)	6	(1)
66	Tacoma, Wash	202.8	*9,012*	170.7	100	1,659	165,900	0.40 to 0.60	6	(1)
67	Youngstown, Ohio	92.2	10,853	41.1	20	986	*19,700*	(1)	(1)	(1)
68	Duluth, Minn	101.6	4,325	*40.9*	50	483	*24,150*	0.90 to 1.00	6	(1)
69	Houston, Tex	63.2	*4,000*	64.4	85	269	17,485	0.65	6	(1)
70	Somerville, Mass	100.3	14,114	106.9	40	246	*9,800*	0.70	5 to 8	30
71	Kansas City, Kans	74.3	8,528	97.0	60	524	31,440	*0.85*	6 to 8	(1)
72	Utica, N. Y	88.8	*12,000*	(1)	....	(1)	(1)	(1)	6	(1)
73	Waterbury, Conn	53.6	5,393	33.5	33	209	6,897	0.45 to 0.50	6	(1)
74	Elizabeth, N. J	71.3	(1)	(1)	....	(1)	(1)	0.50	6	(1)
75	Schenectady, N. Y	96.3	*9,685*	36.7	20	546	11,920	0.30	4	19
76	Hoboken, N. J	19.4	*5,305*	*15.0*	15	*130*	*1,950*	*2.00*	6 to 10	60
77	Manchester, N. H	84.4	6,572	43.6	35	173	6,055	(1)	6	(1)
78	Evansville, Ind	42.2	*4,900*	83.0	89	107	*9,630*	0.50	6 to 8	(1)
79	Birmingham, Ala	96.2	*8,300*	39.3	25	585	*14,625*	(1)	4	(1)
80	Akron, Ohio	108.4	(1)	(1)	....	(1)	(1)	(1)	(1)	(1)
81	Norfolk, Va	90.7	[2] 13,515	[2] 38.0	[2] 15	[2] *1,531*	[2] *25,250*	[2] 0.25	4 to 6	(1)
82	Fort Worth, Tex	*119.0*	(1)	(1)	....	(1)	(1)	(1)	(1)	(1)
83	Wilkes-Barre, Pa	73.0	8,407	(1)	....	616	(1)	(1)	6	12
84	Erie, Pa	81.8	[2] *10,300*	[2] 35.0	[2] 18	[2] 430	[2] 3,738	[2] 0.31	6 to 9	38
85	Savannah, Ga	77.0	*6,278*	(1)	....	(1)	(1)	(1)	4	(1)
86	Peoria, Ill	96.9	*5,300*	(1)	....	310	(1)	(1)	6	(1)
87	Harrisburg, Pa	63.4	(1)	(1)	....	170	4,280	0.50	6	(1)
88	Fort Wayne, Ind	90.0	*6,000*	(1)	....	350	(1)	(1)	(1)	(1)
89	Charleston, S. C	70.5	360	(1)	....	31	(1)	(1)	6	(1)
90	Portland, Me	71.9	(1)	(1)	....	(1)	(1)	(1)	8	(1)
91	Terre Haute, Ind	56.9	2,990	39.0	69	205	14,350	0.35	6	....
92	East St. Louis, Ill	51.0	(1)	(1)	....	(1)	(1)	(1)	6	(1)
93	Holyoke, Mass	45.4	4,900	(1)	....	180	7,200	(1)	5 to 6	....
94	Brockton, Mass	73.9	3,581	32.6	48	334	16,070	0.54	5	7
95	Johnstown, Pa	38.0	(1)	(1)	....	(1)	(1)	(1)	6	(1)
96	Jacksonville, Fla	73.3	4,562	30.0	35	440	13,200	2.00	5	(1)
97	Oklahoma City, Okla	145.6	*8,500*	40.2	25	1,418	*35,450*	0.40	6	(1)
98	Bayonne, N. J	31.5	6,000	28.4	25	504	*12,600*	0.45	6 to 12	250
99	Covington, Ky	54.8	*7,000*	*20.0*	15	315	4,725	0.40	6	3
100	South Bend, Ind	61.3	*5,600*	(1)	....	(1)	(1)	(1)	(1)	(1)
101	Passaic, N. J	45.6	3,867	22.0	30	283	8,500	0.50	6	(1)
102	Altoona, Pa	73.8	*8,000*	*45.0*	30	254	*10,160*	0.45	6	(1)
103	Mobile, Ala	108.9	8,261	(1)	....	301	(1)	(1)	4 to 6	(1)
104	Allentown, Pa	12.7	100	(1)	....	(1)	(1)	(1)	5	(1)
105	Pawtucket, R. I	57.1	5,151	34.1	35	201	*7,035*	0.85	6	12

[1] Not reported.

[2] From main to curb line.

TABLE 5.—SEWERS—HOUSE CONNECTIONS: 1909—Continued.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 27. Figures printed in italics are estimates.]

City number.	CITY.	Total mileage of sewers.	HOUSE CONNECTIONS.							
			At close of year.			Made during year.			Size (inches).	Number of stoppages.
			Number.	Length (miles).	Average length (feet).	Number.	Length (feet).	Average cost per foot.		
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.									
106	Saginaw, Mich.	94.3	[1] 4,600	[1] 17.4	[1] 20	[1] 379	[1] 7,580	[1] $0.55	6	6
107	Canton, Ohio	97.6	6,286	(2)		747	(2)	(2)	4	*100*
108	Wichita, Kans	126.4	*6,000*	(2)		636	(2)	(2)	6	(2)
109	Springfield, Ill	61.5	10,222	48.4	25	191	4,745	0.30	6	(2)
110	Binghamton, N. Y	52.7	[1] *8,500*	[1] *24.0*	[1] 15	[1] 628	[1] 9,420	0.50	6	*104*
111	Lancaster, Pa	43.0	8,500	(2)		1,500	(2)	0.50	6	15
112	Sioux City, Iowa	77.8	*3,150*	53.5	90	220	19,800	*0.40*	6	700
113	Little Rock, Ark	64.0	*10,000*	*101.0*	53	(2)	(2)	(2)	4 to 6	(2)
114	Springfield, Ohio	31.6	[1] *1,800*	[1] 8.0	[1] 23	(2)	[1] 42,000	(2)	6	12
115	Atlantic City, N. J	(3)								
116	Bay City, Mich	103.1	1,716	14.0	43	271	*8,980*	0.30	6	(2)
117	Rockford, Ill	55.1	3,936	19.3	26	512	13,312	0.50	6	*10*
118	York, Pa	[4] 46.0								
119	Lincoln, Nebr	61.9	*6,400*	(2)		806	*56,306*	(2)	4	(2)
120	Chattanooga, Tenn	74.2	[5] *7,521*	[5] 40.0	[5] 28	[5] *1,252*	[5] 37,560	[5] 0.40	4 to 6	(2)
121	Topeka, Kans	*87.4*	*2,452*	(2)		*600*	(2)	(2)	6	(2)
122	Sacramento, Cal	64.9	6,900	144.0	110	*88*	*4,385*	0.20	4 to 6	108
123	Malden, Mass	73.1	5,237	(2)		212	(2)	(2)	6	(2)
124	Haverhill, Mass	45.9	(2)	(2)		135	(2)	(2)	4 to 5	(2)
125	Pueblo, Colo	89.4	5,446	*74.8*	73	216	*15,760*	0.45	4 to 6	(2)
126	Salem, Mass	50.8	(2)	(2)		160	(2)	0.60	5 to 6	*10*
127	New Britain, Conn	86.9	4,282	24.0	30	488	19,520	0.30	6	15
128	Davenport, Iowa	71.6	*6,000*	68.2	60	575	11,500	0.45	6	25
129	McKeesport, Pa	33.2	*4,375*	41.0	49	74	*3,700*	0.50	6 to 12	(2)
130	Wheeling, W. Va	43.8	*7,595*	*21.6*	15	95	*1,425*	0.50	6	91
131	Augusta, Ga	63.5	(2)	(2)		1,356	*33,900*	(2)	4	*419*
132	Superior, Wis	56.6	2,234	24.0	57	161	*9,660*	*0.60*	6	*6*
133	Newton, Mass	164.5	5,665	73.8	69	171	13,295	0.61	5 to 8	136
134	Dubuque, Iowa	41.4	1,922	20.0	55	88	4,840	(2)	4 to 6	
135	Butte, Mont	33.9	3,206	24.3	40	211	*8,440*	1.00	6	(2)
136	Chester, Pa	32.5	5,500	(2)		(2)	(2)	(2)	5	(2)
137	Kalamazoo, Mich	71.7	2,855	20.0	37	458	15,114	0.33	4 to 6	(2)
138	Montgomery, Ala	89.7	8,732	(2)		248	(2)	0.60	4 to 6	(2)
139	Woonsocket, R. I	18.5	1,191	11.1	49	74	*4,160*	1.00	6	2
140	Galveston, Tex	36.8	[6] *2,458*	[6] 4.6	[6] 10	[6] 500	[6] 5,000	[6] 0.25	4 to 6	(2)
141	Fitchburg, Mass	40.3	3,126	(2)		150	5,000	0.40	5	(2)
142	Racine, Wis	67.2	8,318	(2)		315	(2)	(2)	6	(2)
143	Elmira, N. Y	49.6	4,077	38.6	50	296	14,800	0.30	6	20
144	Quincy, Ill	34.7	(2)	2.3		80	1,600	(2)	6	(2)
145	Knoxville, Tenn	54.2	5,100	29.0	30	700	*17,500*	0.50	6	*70*
146	New Castle, Pa	62.3	*11,880*	*67.0*	30	*400*	*12,000*	0.55	4	24
147[a]	Macon, Ga	73.9	(2)	(2)		516	(2)	(2)	6	153
148	Auburn, N. Y	*85.9*	[1] 18,140	[1] *41.2*	[1] 12	[1] 3,400	[1] 78,754	[1] 0.40	5 to 6	*6*
149	West Hoboken, N. J	20.2	*3,500*	40.0	60	158	1,580	0.50 to 0.80	5 to 10	15
150	Joliet, Ill	35.0	*4,000*	37.0	49	375	18,750	0.50	6	*50*
151	Taunton, Mass	29.1	1,892	(2)		112	6,633	0.40	5 to 6	(2)
152	Everett, Mass	54.7	4,662	27.0	31	34	1,020	0.75	6	3
153	Oshkosh, Wis	73.0	(2)	(2)		158		(2)	6	(2)
154	Chelsea, Mass	37.3	(2)	(2)		277	6,925	0.60	5	(2)
155	Joplin, Mo	32.4	*4,000*	15.2	20	136	2,720	0.25	4 to 6	10
156	La Crosse, Wis	28.9	*3,065*	(2)		87	(2)	(2)	5 to 6	(2)
157	Newport, Ky	27.6	2,315	20.3	46	166	8,300	0.50	6 to 8	54
158	South Omaha, Nebr	21.0	(2)	(2)		45	(2)	(2)	6	(2)

[1] From main to curb line.
[2] Not reported.
[3] Sewer system owned by private corporation.
[4] Sewer system not in use, as state laws prohibit the pollution of Codorus Creek, into which the system discharged sewage.
[5] From main to property line.
[6] From main to property line. Main sewers laid in alleys.

TABLE 6.—SEWERS—FLUSHING OF SEWERS AND

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see

City number.	CITY.	Total mileage of sewers.	Kind of sewer.	FLUSHING OF SEWERS.					
				Miles flushed during year.	Schedule of flushing.	Flushed by hose attached to hydrants.	Flushed by specified number of—		
							Direct connections with water mains.	Automatic flush tanks.	Portable flush tanks.
	Grand total	25,011.2					5,155	10,602	29
	Group I	11,013.0					51	1,772	7
	Group II	6,094.4					1,392	4,046	9
	Group III	4,831.2					1,891	3,025	9
	Group IV	3,072.6					1,821	1,759	4
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.								
1	New York, N. Y	1,907.9		[1] 356.0		Yes	1	207	
	Manhattan Borough	523.3	Combined	213.0	No schedule	Yes			
	Bronx Borough	283.3	Sanitary and combined	75.0	No schedule	Yes		4	
	Brooklyn Borough	830.3	All three	(3)	No schedule	Yes			
	Queens Borough	196.0	All three	68.0	No schedule	Yes	1	1	
	Richmond Borough	75.0	Sanitary and combined	(3)	Laterals daily	Yes		202	
2	Chicago, Ill	1,837.0	All three	568.0	No schedule	Yes		18	2
3	Philadelphia, Pa	1,185.1	All three	(3)	No schedule	Yes			
4	St. Louis, Mo	649.0	Combined	*38.0*	No schedule	Yes			
5	Boston, Mass	765.6	All three	(3)	No schedule	Yes			
6	Baltimore, Md	77.4	Combined	(3)	No schedule	Yes			
7	Cleveland, Ohio	529.2	All three	55.7	No schedule	Yes		35	
8	Pittsburgh, Pa	542.2	Sanitary and combined	3.0	No schedule	Yes			
9	Detroit, Mich	631.6	Combined	*800.0*	Once or twice a year	Yes	50		
10	Buffalo, N. Y	507.0	Combined	(3)	No schedule	Yes		2	
11	San Francisco, Cal	358.9	All three	136.0	No schedule	Yes			
12	Cincinnati, Ohio	326.0	Combined	30.0	No schedule	Yes			
13	Milwaukee, Wis	419.4	Combined	66.3	No schedule	Yes			
14	Newark, N. J	269.0	All three	42.8	No schedule	Yes		104	
15	New Orleans, La	464.3	Sanitary and storm-water	(3)	Laterals daily	Yes		1,265	
16	Washington, D. C	543.4	Sanitary and combined	345.8	Twice a year	Yes		141	5
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.								
17	Minneapolis, Minn	257.4	Sanitary and combined	(3)	Laterals twice a month	Yes		81	
18	Los Angeles, Cal	439.0	Sanitary and storm-water	706.0	Laterals daily	Yes		1,696	
19	Jersey City, N. J	126.5	Combined and storm-water	(3)	No schedule	Yes			
20	Kansas City, Mo	354.5	Combined and storm-water	22,630.0	No schedule	Yes		278	
21	Indianapolis, Ind	257.3	All three	(3)	Laterals daily	Yes		90	
22	Louisville, Ky	152.3	Combined	(3)	(3)	Yes			
23	Seattle, Wash	247.2	Combined	36.2	No schedule	Yes		335	
24	Providence, R. I	228.6	Combined and storm-water	30.0	Part of system twice a year; remainder, once.	Yes			4
25	Rochester, N. Y	266.0	Combined and storm-water	*300.0*	No schedule	Yes			
26	St. Paul, Minn	281.4	All three	300.0	150 miles twice a year	Yes		32	
27	Denver, Colo	429.3	All three	(3)	Part, about once in 9 days; other, 9 times a year.	Yes		366	3
28	Portland, Oreg	189.0	Combined	18.0	No schedule	Yes			
29	Columbus, Ohio	207.3	All three	*900.0*	Laterals daily	No		135	
30	Toledo, Ohio	231.4	Combined	146.0	No schedule	Yes		60	
31	Worcester, Mass	192.3	All three	576.8	3 times a year	Yes	83	10	
32	Atlanta, Ga	161.2	Combined	*459.0*	6 times a week	No	400		
33	Syracuse, N. Y	164.8	Sanitary and combined	(3)	No schedule	Yes			
34	New Haven, Conn	116.0	Combined	*100.0*	Once a year	No			1
35	Scranton, Pa	110.9	Combined		No schedule	(3)			
36	Paterson, N. J	84.6	Sanitary and combined	12.0	No schedule	Yes			
37	Omaha, Nebr	182.4	Sanitary and combined	*55,115.0*	Laterals once in 8 hours	Yes		596	
38	Fall River, Mass	71.4	Combined	0.4	No schedule	Yes			
39	Memphis, Tenn	277.2	Sanitary	87,455.0	Laterals daily	No		350	
40	Richmond, Va	106.8	Sanitary and combined	*1.5*	No schedule	Yes	6		
41	Oakland, Cal	239.0	All three	120.0	No schedule	Yes		2	
42	Grand Rapids, Mich	178.5	All three	(3)	(3)	Yes			
43	Nashville, Tenn	98.5	Combined	1,097.0	2 miles once a year, 3 miles daily	Yes		15	
44	Lowell, Mass	105.5	All three	(3)	No schedule	Yes	5		
45	Cambridge, Mass	140.6	All three	(3)	(3)	Yes			1
46	Dayton, Ohio	197.5	All three	1,464.0	Every 2 weeks	No	898		

[1] The report is not complete for all boroughs.

[2] Includes stoppages in catch basins.

[3] Not reported.

[4] 18,772 cubic yards of "basin dirt" removed. Number cleaned not reported.

CLEANING OF SEWERS AND CATCH BASINS: 1909.

page 85. For a text discussion of this table, see page 28. Figures printed in italics are estimates.]

CLEANING OF SEWERS AND CATCH BASINS.								
Sewers.				Catch basins.				
Number of stoppages in system during year.	Number of miles cleaned during year.	Cost of cleaning per mile.	Method of cleaning.	Total number.	Number cleaned during year.	Cubic yards of silt removed per basin per cleaning.	Number of specially-constructed wagons for removal of silt.	City number.
...	...	...	...	390,253	...	...	...	
...	...	...	...	211,941	...	...	...	
...	...	...	...	82,510	...	...	...	
...	...	...	...	56,048	...	...	...	
...	...	...	...	39,754	...	...	...	
GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.								
[1] 3,027	902.0	$216.73	...	22,483	67,748	(1)	...	1
[2] 2,823	248.8	362.45	(3)	6,348	14,381	1.19	...	
193	108.5	152.31	Shovels and buckets	3,625	5,336	1.02	...	
(3)	447.7	122.33	Buckets and gasoline engines	10,323	33,964	0.35	...	
(3)	68.0	470.00	Hand sewer-cleaning machine	1,496	5,063	2.95	...	
11	29.0	70.99	Hand cleaning machine and rods	691	9,004	(3)	...	
(3)	98.3	406.56	Scrapers on endless chain	73,843	25,976	2.00	20	2
(3)	(3)	(3)	Use of rakes	37,743	895,778	(3)	(3)	3
53	*15.0*	(3)	Flushing and suction	13,508	27,999	*1.09*	...	4
(3)	11.1	(3)	Shovels attached to carriage and a form of hoe	*17,500*	6,989	3.36	11	5
(3)	(3)	(3)	Scrapers and hoisting buckets	(3)	(3)	(3)	...	
								6
201	55.7	194.00	Sewer-cleaning machine and flushing	*14,754*	*20,140*	2.00	...	7
(3)	...	...		*5,400*	*48,600*	0.50	18	8
280	200.0	328.00	Sewer-cleaning machines	(3)	*3,000*	0.25	...	9
150	7.3	307.32	Sewer-cleaning machines and winches	4,700	29,681	*0.33*	1	10
645	225.0	161.00	(3)	(3)	9,916	0.88	...	11
8	30.0	12.00	Flushing machines	5,267	(3)	(4)	4	12
(3)	6.2	(3)	Scraping machines	8,889	7,258	1.22	...	13
39	49.8	170.00	Drawing hose charged with water through sewer	3,407	5,157	1.60	...	14
(3)	(3)	(3)	Flushing only	(3)	(3)	(3)	...	15
66	31.2	213.94	Jointed rods and flushing	4,447	52,634	0.13	18	16
GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.								
...	(3)	(3)	Jointed rods, scrapers, and rolling balls	6,353	(3)	(3)	...	17
40	(3)	(3)	Flushing only	*450*	*6,606*	[5] 1.00	...	18
(3)	(3)	(3)	(3)	2,800	2,800	(3)	3	19
962	*115.0*	4.47	Sewer-cleaning machine	4,575	1,664	(6)	...	20
6,191	0.9	(3)	Endless cable hand sewer machine	5,287	2,446	2.50	7	21
3	100.0	*60.00*	Cable sewer machine and jointed rods	5,000	4,227	1.00	13	22
(3)	11.0	274.00	Flushing and spiral springs	5,269	32,150	0.29	2	23
6	3.0	(3)	Scrapers and jointed rods	5,130	8,816	*1.72*	24	24
190	*2.0*	(3)	Sewer-cleaning machine, scrapers, and rods	...	...	...		25
75	(3)	...	Jointed rods and rolling balls	5,914	*1,750*	1.00	...	26
...	(3)	(3)	Scrapers	(3)	(3)	(3)	...	27
240	35.0	(3)	Jointed rods and flushing	*4,140*	*5,000*	1.50	...	28
322	13.0	(3)	Jointed rods and sewer-cleaning machine	3,022	12,088	0.80	1	29
(3)	3.0	11.00	Sewer machines	(3)	2,551	0.69	1	30
2	192.2	31.24	Scrapers and pails on sectional tracks	3,138	5,142	1.48	2	31
(3)	(3)	(3)	Jointed rods	4,100	*93,900*	*0.09*	...	32
...	*2.0*	(3)	Sewer-cleaning machines	(3)	560	*0.50*	4	33
...	114.0	(3)	Flushing only	2,785	2,785	1.50	...	34
(3)	221.9	(3)	Chains dragged through sewers	1,044	1,044	(3)	...	35
3	(3)	(3)	Jointed rods	3,760	5,455	1.25	...	36
...	1.5	(3)	Jointed rods	3,600	7,250	0.04	...	37
18	0.2	(3)	Jointed rods	972	2,357	0.62	2	38
500	5.0	120.00	Long cables and flushing	...	...	...	...	39
1	*1.5*	(3)	Jointed rods and flushing	1,538	774	0.99	...	40
40	4.0	(3)	Rods, scoop lines, and derrick	*500*	350	0.75	...	41
(3)	(3)	(3)	Chains, jointed rods, and patented sewer machines	*1,800*	*1,800*	1.50	4	42
...	1.0	120.00	Jointed rods and scrapers	*4,500*	*80,500*	0.06	...	43
7	75.0	41.00	Jointed rods	3,473	3,473	1.20	...	44
(3)	(3)	(3)	Scrapers	(3)	2,742	1.26	4	45
1	20.0	*200.00*	Cleaning machines and rods	*3,360*	1,506	1.00	1	46

---

[5] Average quantity removed from 748 catch basins. The silt in other basins was flushed into sewers.

[6] Cleaned by flushing from hose attached to hydrants.

TABLE 6.—SEWERS—FLUSHING OF SEWERS AND

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see

City number.	CITY.	Total mileage of sewers.	Kind of sewer.	FLUSHING OF SEWERS.					
				Miles flushed during year.	Schedule of flushing.	Flushed by hose attached to hydrants.	Flushed by specified number of—		
							Direct connections with water mains.	Automatic flush tanks.	Portable flush tanks.
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.								
47	Albany, N. Y	101.4	Combined	(1)	No schedule	Yes			
48	Bridgeport, Conn	91.0	Combined	(1)	No schedule	Yes			
49	Spokane, Wash	63.6	Combined	46,398.0	Laterals twice daily	No		411	
50	Hartford, Conn	116.6	Combined and storm-water	(1)	No schedule	Yes			
51	Reading, Pa	115.8	Sanitary and storm-water	101.8	Once a year	Yes			
52	Trenton, N. J	91.3	All three	23,663.0	Sanitary, daily	No		300	
53	San Antonio, Tex	98.9	Sanitary and storm-water	(1)	Twice a day	Yes		195	
54	New Bedford, Mass	87.9	All three		No schedule	Yes			
55	Camden, N. J	70.8	Combined		No schedule	Yes			
56	Dallas, Tex	131.2	Sanitary and storm-water	*2.0*	3 times a year	Yes			
57	Salt Lake City, Utah	124.7	Sanitary and storm-water	*6,500.0*	Part once a week; other, once a month.	Yes	1	618	
58	Lynn, Mass	78.1	Combined and storm-water	(1)	Once in 6 weeks	Yes	18		
59	Wilmington, Del	96.9	Sanitary and combined	193.8	No schedule	No		5	1
60	Springfield, Mass	118.8	All three	24.9	21 times a year	No	447	1	
61	Des Moines, Iowa	119.0	All three	*125.0*	No schedule	Yes			4
62	Lawrence, Mass	69.8	All three	*1.5*	No schedule	Yes			
63	St. Joseph, Mo	93.6	Combined	*10.0*	No schedule	Yes			
64	Troy, N. Y	54.2	Combined	(1)	No schedule	Yes			
65	Yonkers, N. Y	48.6	All three	(1)	No schedule	Yes			
66	Tacoma, Wash	202.8	Sanitary and storm-water	354.5	Some weekly; others, once a month.	Yes		12	
67	Youngstown, Ohio	92.2	Combined	(1)	(1)	Yes	(1)		
68	Duluth, Minn	101.6	Sanitary and storm-water	160.0	Twice a year	Yes			1
69	Houston, Tex	63.2	All three	5.0	Laterals twice a day	Yes		46	
70	Somerville, Mass	100.3	All three	*750.0*	25 miles twice a month; 75 miles twice a year.	Yes	116		
71	Kansas City, Kans	74.3	Combined	126.0	No schedule	Yes			
72	Utica, N. Y	88.8	All three	(1)	No schedule	Yes		6	
73	Waterbury, Conn	53.6	Sanitary and storm-water	36.0	No schedule	No			1
74	Elizabeth, N. J	71.3	Combined		No schedule	Yes			
75	Schenectady, N. Y	96.3	All three	75.0	No schedule	Yes			
76	Hoboken, N. J	19.4	Combined	5.0	No schedule	Yes			
77	Manchester, N. H	84.4	Combined	(1)	No schedule	Yes			2
78	Evansville, Ind	42.2	Combined	1.0	No schedule	Yes			
79	Birmingham, Ala	96.2	Sanitary and storm-water	(1)	No schedule	Yes			
80	Akron, Ohio	108.4	Sanitary and storm-water	(1)	(1)	Yes		1	
81	Norfolk, Va	90.7	Sanitary and storm-water	7,145.0	Twice a week	No		*423*	
82	Fort Worth, Tex	119.0	Sanitary and storm-water	5,980.0	Once a week	No	*1,000*		
83	Wilkes-Barre, Pa	73.0	Combined	(1)	No schedule	Yes		[2] 19	
84	Erie, Pa	81.8	Combined	2.0	No schedule	Yes			
85	Savannah, Ga	77.0	Sanitary and storm-water	18,615.0	Laterals daily	No		186	
86	Peoria, Ill	96.9	Combined and storm-water	(1)	No schedule	Yes		[2] 242	
87	Harrisburg, Pa	63.4	Combined	(1)	No schedule	Yes			
88	Fort Wayne, Ind	90.0	Combined	(1)	(1)	Yes			
89	Charleston, S. C	70.5	Sanitary and storm-water	3,942.0	Laterals daily	No		26	
90	Portland, Me	71.9	Sanitary and combined	(1)	No schedule	Yes			
91	Terre Haute, Ind	56.9	Combined	*10.0*	No schedule	Yes			
92	East St. Louis, Ill	51.0	Combined	102.0	Twice a year	Yes			
93	Holyoke, Mass	45.4	Combined and storm-water		No schedule	Yes	1		
94	Brockton, Mass	73.9	Sanitary and storm-water	120.0	Three times a year	Yes	137		
95	Johnstown, Pa	38.0	Combined		No schedule	Yes			
96	Jacksonville, Fla	73.3	All three	2,520.0	36 times a year	Yes		40	
97	Oklahoma City, Okla	145.6	All three	*200.0*	Laterals 4 times a day; other, once a week.	Yes		5	
98	Bayonne, N. J	31.5	Combined		No schedule	Yes			
99	Covington, Ky	54.8	Combined	10.0	Part once a year	Yes			
100	South Bend, Ind	61.3	Combined	(1)	(1)	Yes		132	
101	Passaic, N. J	45.6	Sanitary and combined	39.0	(1)	No		230	
102	Altoona, Pa	73.8	Sanitary and storm-water	1.0	(1)	No	1		
103	Mobile, Ala	108.9	Sanitary and storm-water	450.0	In whole 5 times, in part daily	Yes		5	
104	Allentown, Pa	12.7	Combined and storm-water		No schedule	Yes			
105	Pawtucket, R. I	57.1	Combined	114.1	Twice a year	Yes	170	122	

---

[1] Not reported.

CLEANING OF SEWERS AND CATCH BASINS: 1909—Continued.

page 85. For a text discussion of this table, see page 28. Figures printed in italics are estimates.

CLEANING OF SEWERS AND CATCH BASINS.								
Sewers.				Catch basins.				
Number of stoppages in system during year.	Number of miles cleaned during year.	Cost of cleaning per mile.	Method of cleaning.	Total number.	Number cleaned during year.	Cubic yards of silt removed per basin per cleaning.	Number of specially constructed wagons for removal of silt.	City number.
GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.								
(1)	(1)	(1)	Jointed rods	*1,500*	1,057	1.50	3	47
(1)	(1)	(1)	Sewer-cleaning machines	1,559	3,118	1.50	....	48
52	3.0	$21.00	(1)	2,000	1,480	1.69	....	49
15	0.5	(1)	Dredge buckets and flushing	2,151	2,151	1.50	4	50
(1)	(1)	(1)	....	660	660	(1)	2	51
25	(1)	(1)	Chains and jointed rods	(1)	(1)	(1)	....	52
....	....	....	....	(1)	(1)	(1)	....	53
....	....	....	....	1,026	1,026	1.00	....	54
(1)	(1)	(1)	....	*1,200*	*1,200*	(1)	1	55
569	1.0	200.00	Jointed rods	*500*	*6,000*	0.08	....	56
2	*2,000.0*	*2.25*	Chains and sewer rods	....	....	....	....	57
200	*10.0*	*300.00*	Scrapers dragged through sewer	1,215	988	2.59	3	58
....	(1)	(1)	Rods and cleaning machines	30	*300*	(1)	2	59
....	(1)	(1)	Scrapers and flushing	(1)	(1)	(1)	....	60
....	(1)	(1)	Jointed rods, chains and flushing	*1,400*	4,682	0.50	2	61
155	2.0	(1)	Sewer-cleaning machine	1,271	2,610	1.00	2	62
28	10.0	(1)	Jointed rods	2,320	4,524	(1)	....	63
(1)	(1)	(1)	Rods and scrapers	(1)	984	(1)	....	64
....	(1)	(1)	Flushing only	*1,000*	1,180	1.50	2	65
(1)	3.1	(1)	Jointed rods	*1,500*	9,360	0.60	....	66
(1)	(1)	(1)	Flushing only	*3,500*	*3,500*	(1)	4	67
(1)	*1.0*	(1)	Flushing only	840	(1)	1.00	1	68
33	(1)	(1)	Jointed rods, chains and buckets	503	5,030	0.25	....	69
....	*300.0*	(1)	Scrapers and rods	1,565	6,260	1.00	(1)	70
624	35.0	(1)	Jointed rods with nozzle attached	760	2,080	(1)	....	71
(1)	(1)	(1)	Jointed rods and flushing	1,961	(1)	0.50	....	72
3	46.0	(1)	Use of rope and wire	(1)	(1)	(1)	....	73
12	4.0	20.00	Rods attached to rope	(1)	*450*	(1)	2	74
120	(1)	(1)	Flushing and pumping	398	(1)	1.00	1	75
....	5.0	(1)	Sewer-cleaning machine	560	1,400	1.20	....	76
12	....	(1)	Scrapers	(1)	1,644	(1)	1	77
10	(1)	(1)	Jointed rods	*1,680*	*800*	0.36	....	78
(1)	*96.0*	*30.00*	Jointed rods and flushing	*40*	*400*	0.12	....	79
(1)	(1)	(1)	....	450	(1)	(1)	(1)	80
75	*20.0*	*78.00*	Rope and brush	*840*	*800*	*1.00*	....	81
....	(1)	(1)	Jointed rods	(1)	(1)	(1)	....	82
6	1.0	(1)	Jointed rods and brushes	(1)	(1)	(1)	....	83
....	....	....	....	900	*1,800*	0.40	1	84
(1)	(1)	(1)	Jointed rods and flushing	1,423	16,428	*0.69*	....	85
....	....	....	....	1,027	*1,020*	*1.00*	....	86
(1)	(1)	(1)	Rods attached to rope	2,500	2,500	(1)	3	87
(1)	(1)	(1)	Sewer rods	*800*	*1,800*	(1)	(1)	88
(1)	(1)	(1)	Flushing only	(1)	(1)	(1)	....	89
(1)	(1)	(1)	Small rods	1,224	*1,522*	1.17	2	90
3	*1.0*	(1)	Flushing and going into large ones	293	1,300	0.75	....	91
10	*34.0*	85.00	Buckets attached to cables	*1,500*	*4,500*	0.50	....	92
....	....	....	....	*800*	*535*	(1)	4	93
1	....	....	....	400	400	2.00	....	94
(1)	(1)	(1)	Wire rods attached to ropes	389	389	(1)	....	95
55	(1)	(1)	Jointed rods and flushing	350	5,250	0.08	....	96
100	(1)	(1)	Sewer rods and flushing	*1,700*	*3,400*	*2.25*	....	97
(1)	*0.2*	(1)	(1)	*400*	*400*	(1)	....	98
....	....	....	....	681	681	1.50	....	99
(1)	(1)	(1)	Sewer-draining machine	7,758	(1)	(1)	....	100
11	3.5	(1)	Rods and steel buckets	225	225	(1)	2	101
6	(1)	(1)	Jointed rods and wire rope	*156*	*312*	0.50	....	102
150	(1)	14.50	Jointed rods	(1)	(1)	(1)	....	103
....	....	....	....	(1)	(1)	(1)	....	104
....	....	....	....	1,093	992	1.60	6	105

TABLE 6.—SEWERS—FLUSHING OF SEWERS AND

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see

GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.

City number.	CITY.	Total mileage of sewers.	Kind of sewer.	FLUSHING OF SEWERS.					
				Miles flushed during year.	Schedule of flushing.	Flushed by hose attached to hydrants.	Flushed by specified number of— Direct connections with water mains.	Automatic flush tanks.	Portable flush tanks.
106	Saginaw, Mich	94.3	Combined	(1)	(1)	Yes			
107	Canton, Ohio	97.6	Sanitary and storm-water	(1)	(1)	Yes		205	
108	Wichita, Kans	126.4	Sanitary and storm-water	(1)	(1)	Yes		130	
109	Springfield, Ill	61.5	Combined	10.0	Twice a month	Yes			
110	Binghamton, N. Y	52.7	Combined and storm-water	145.2	3 times a year	Yes	165		
111	Lancaster, Pa	43.0	Combined	86.0	No schedule	Yes			
112	Sioux City, Iowa	77.8	All three	500.0	No schedule	Yes			
113	Little Rock, Ark	64.0	Sanitary and storm-water	960.0	Laterals every 8 hours	No		128	
114	Springfield, Ohio	31.6	All three	300.0	Ten times a year	Yes			
115	Atlantic City, N. J	(2)			No schedule	Yes			
116	Bay City, Mich	103.1	Combined	(1)	(1)	Yes			
117	Rockford, Ill	55.1	Sanitary and storm-water	10.0	Laterals daily; other, twice a year	Yes		31	
118	York, Pa	[3] 46.0	Sanitary and storm-water		No schedule	Yes			
119	Lincoln, Nebr	61.9	All three	(1)	(1)	No		122	
120	Chattanooga, Tenn	74.2	Sanitary and combined	58.0	Once a year	Yes			
121	Topeka, Kans	87.4	Combined	(1)	(1)	Yes		150	
122	Sacramento, Cal	64.9	Combined	100.0	Part, once a week; other, once a year.	Yes		25	
123	Malden, Mass	73.1	Sanitary and storm-water	0.5	Once a year	No	1,300		
124	Haverhill, Mass	45.9	All three	(1)	No schedule	Yes			
125	Pueblo, Colo	89.4	Sanitary and combined	235.0	No schedule	Yes		169	
126	Salem, Mass	50.8	Combined	152.4	3 times a year	Yes			
127	New Britain, Conn	86.9	Sanitary and storm-water		No schedule	Yes			
128	Davenport, Iowa	71.6	Combined and storm-water	2.0	No schedule	Yes			
129	McKeesport, Pa	33.2	Combined and storm-water	(1)	4 times a year	Yes			
130	Wheeling, W. Va	43.8	Combined	4.0	No schedule	Yes			
131	Augusta, Ga	63.5	Combined	1,440.0	24 times a year	Yes		6	
132	Superior, Wis	56.6	Combined	50.0	No schedule	Yes			
133	Newton, Mass	164.5	Sanitary and storm-water	1,294.4	Once a month	Yes	191		
134	Dubuque, Iowa	41.4	Sanitary and storm-water	62.0	Twice a year	Yes			
135	Butte, Mont	33.9	Sanitary and storm-water	80.8	3 times a year	Yes	20		
136	Chester, Pa	32.5	Combined		No schedule	Yes			
137	Kalamazoo, Mich	71.7	Sanitary and storm-water	71.7	Laterals every 8 hours	No		147	
138	Montgomery, Ala	89.7	Sanitary and storm-water	5,548.1	Twice a week	Yes		2	
139	Woonsocket, R. I	18.5	Sanitary	55.5	3 times a year	Yes	37		
140	Galveston, Tex	36.8	All three	368.0	10 times a year	Yes			
141	Fitchburg, Mass	40.3	Combined	3.0	No schedule	Yes			
142	Racine, Wis	67.2	Combined	134.4	Twice a year	Yes		[4] 120	
143	Elmira, N. Y	49.6	Combined	42.0	All, once a year; half, twice a year.	Yes		2	
144	Quincy, Ill	34.7	Combined and storm-water	(1)	Every 40 hours	Yes		21	1
145	Knoxville, Tenn	54.2	Sanitary and storm-water	650.0	No schedule	Yes		50	
146	New Castle, Pa	62.3	Sanitary and storm-water	39,427.0	Laterals, twice a day	No		180	
147	Macon, Ga	73.9	Sanitary and storm-water	11,205.0	4 times a week	No	(1)	50	
148	Auburn, N. Y	85.9	All three	120.0	Once a year	Yes		2	
149	West Hoboken, N. J	20.2	Combined	(1)	No schedule	Yes			
150	Joliet, Ill	35.0	Combined	2.0	No schedule	Yes			
151	Taunton, Mass	29.1	Sanitary and storm-water	398.0	Once a month	Yes	58		
152	Everett, Mass	54.7	All three	25.0	2 or 3 times a year	Yes			
153	Oshkosh, Wis	73.0	Combined	365.0	5 times a year	No			2
154	Chelsea, Mass	37.3	Combined and storm-water	10.0	No schedule	Yes	50	4	
155	Joplin, Mo	32.4	Sanitary and storm-water	(1)	Laterals, twice a day	No		77	1
156	Lacrosse, Wis	28.9	Combined	57.7	Twice a year	Yes			
157	Newport, Ky	27.6	Combined	27.6	Laterals, once a day	No		138	
158	South Omaha, Nebr	21.0	Sanitary and combined	(1)	(1)	Yes			

---

[1] Not reported.
[2] Sewer system owned by private corporation.
[3] Sewer system not in use, as state laws prohibit the pollution of Codorus Creek, into which the system discharged sewage.
[4] Includes 350 "inlets" without catch basins.

CLEANING OF SEWERS AND CATCH BASINS: 1909—Continued.

page 25. For a text discussion of this table, see page 28. Figures printed in italics are estimates.]

CLEANING OF SEWERS AND CATCH BASINS.								City number.
Sewers.				Catch basins.				
Number of stoppages in system during year.	Number of miles cleaned during year.	Cost of cleaning per mile.	Method of cleaning.	Total number.	Number cleaned during year.	Cubic yards of silt removed per basin per cleaning.	Number of specially constructed wagons for removal of silt.	
GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.								
...	(1)	(1)	...	3,164	*500*	1.50	4	106
100	(1)	(1)	Flushing only	660	(1)	(1)	2	107
205	(1)	(1)	Dragging rods through sewers	1,100	8,100	(1)	1	108
...	...	...	...	3,264	(1)	(1)	...	109
...	...	...	...	1,254	1,881	0.33	1	110
25	(1)	(1)	Flushing only	(1)	(1)	(1)	...	111
1,260	2.0	*360.00*	Flushing only	897	30	0.50	...	112
84	...	...	Jointed rods	8	32	1.56	...	113
1	0.5	(1)	Jointed rods	*800*	*4,400*	*0.18*	(1)	114
...	...	...	...	...	...	...	...	115
(1)	(1)	(1)	Jointed rods, chains, and flushing	*1,600*	(1)	1.00	...	116
5	0.7	20.00	Rods and scrapers	228	228	1.00	1	117
...	...	...	...	(1)	(1)	(1)	...	118
7	(1)	(1)	Rods and flushing	250	(1)	(1)	...	119
6	*13.2*	*21.90*	Scrapers	[4]*750*	*1,000*	0.88	...	120
(1)	(1)	(1)	Rods and flushing	*600*	576	(1)	...	121
350	10.0	(1)	Boat and buckets	843	2,529	0.75	1	122
(1)	(1)	(1)	Flushing only	*500*	*1,000*	1.00	...	123
(1)	(1)	(1)	Rods and steel buckets	1,560	*4,500*	(1)	...	124
120	*20.0*	(1)	Jointed rods and flushing	197	*2,600*	(5)	...	125
2	7.5	263.91	Flushing and scoops drawn by horses	650	1,300	1.00	1	126
...	10.0	(1)	Cleaning machines	504	1,008	1.50	...	127
3	1.0	(1)	Jointed rods and flushing	*325*	*325*	0.25	...	128
6	(1)	(1)	Rods	*600*	(1)	(1)	1	129
55	(1)	(1)	Flushing only	158	474	0.20	...	130
...	(1)	(1)	Flushing only	1,798	(1)	(1)	...	131
...	*2.0*	*25.00*	(1)	878	593	1.00	1	132
...	106.1	62.71	Brushes, scrapers, and flushing	2,404	2,400	1.90	...	133
2	(1)	(1)	Scrapers and jointed rods	650	2,600	0.37	...	134
100	(1)	(1)	Jointed rods and chains	213	15	0.50	...	135
2	(1)	(1)	Rods and buckets	(1)	(1)	(1)	...	136
4	0.5	(1)	Sewer-cleaning machine and rods	639	[6]7	14.00	3	137
...	...	...	...	*1,000*	*1,000*	(1)	...	138
3	...	...	Flushing only	(1)	(1)	(1)	...	139
(1)	(1)	(1)	Jointed rods	348	2,088	0.25	...	140
(1)	3.0	(1)	(1)	800	800	(1)	...	141
...	1.0	(1)	Jointed rods and cleaning machine	1,100	2,200	1.00	...	142
10	42.0	3.07	Scrapers and scoops	1,601	1,601	0.11	...	143
(1)	(1)	(1)	Jointed rods and buckets	290	690	1.00	...	144
70	5.0	(1)	Scrapers, jointed rods, and flushing	*780*	*850*	0.78	...	145
10	0.5	100.00	Jointed rods	98	*196*	0.50	...	146
(1)	(1)	(1)	Jointed rods	1,080	...	...	...	147
12	(1)	(1)	Flushing only	*600*	(1)	(1)	...	148
...	0.5	200.00	(1)	420	520	3.23	...	149
2	2.0	25.00	Scrapers	1,960	1,960	1.25	1	150
...	...	...	...	550	890	0.82	1	151
(1)	*54.0*	(1)	Sewer-cleaning machine	523	1,046	1.50	2	152
4	(1)	(1)	Jointed rods and scrapers	(1)	(1)	1.00	...	153
(1)	10.0	98.00	Machine scrapers	(1)	(1)	(1)	3	154
25	2.0	50.00	Sewer rods, chains, and flushing	50	10	1.00	...	155
(1)	...	(1)	Jointed rods	915	1,830	1.00	...	156
150	5.0	60.00	Rods and flushing	455	727	1.41	2	157
6	(1)	(1)	Rods and flushing	*750*	(1)	(1)	...	158

[5] Cleaned by flushing from hose attached to hydrants.

[6] 7 large siphon catch basins, which are cleaned once a year. All others are unsealed and flushed by storm water.

[7] Not in use.

TABLE 7.—SEWERS—DISCHARGE OF SEWAGE: 1909.

[Cities having no record, and making no estimates of volume of sewage, are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 29. All figures not printed in italics are estimates.]

City number.	CITY.	VOLUME OF SEWAGE DISCHARGED.					Stream or body of water into which sewage is discharged.
		Estimate of discharge based on—	Daily during year (gallons).				
			Average.	Maximum.	Minimum.	Average per person served.	
	Grand total		2,764,185,883	2,484,277,096	1,412,182,266	164	
	Group I		1,719,703,838	1,240,895,744	818,290,799	172	
	Group II		510,443,330	657,119,879	260,316,150	163	
	Group III		371,059,617	364,106,565	246,313,480	140	
	Group IV		162,979,098	222,154,908	87,261,837	152	
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.						
1	New York, N. Y.		510,411,200	(1)	(1)	119	
	Manhattan Borough	Water consumption	273,000,000	(1)	(1)	120	North and East Rivers.
	Bronx Borough	Water consumption	50,000,000	(1)	(1)	125	Harlem and East rivers.
	Brooklyn Borough	Water consumption	150,836,000	(1)	(1)	108	Jamaica, Sheepshead, and Gravesend Bays.
	Queens Borough	Water consumption	28,210,500	(1)	(1)	188	Jamaica Bay and Flushing River.
	Richmond Borough	Water consumption	8,364,700	(1)	(1)	167	New York Bay.
2	Chicago, Ill.	Pumpage of water	482,026,000	541,111,000	423,000,000	275	Chicago River to Desplaines River.
4	St. Louis, Mo.	Measurement of flow in three representative districts.	105,882,616	126,255,698	61,693,125	181	Mississippi River.
5	Boston, Mass.	Metered water consumption and measurement of velocity of flow.	*111,238,000*	*215,503,500*	*82,164,000*	170	Boston Harbor.
7	Cleveland, Ohio	Pumpage of water	52,812,000	(1)	(1)	100	Cuyahoga River and Lake Erie.
8	Pittsburgh, Pa.	Gauging the flow of discharge	125,000,000	(1)	(1)	250	Allegheny, Monongahela, and Ohio Rivers.
10	Buffalo, N. Y.	Water consumption	134,761,646	175,372,250	114,168,100	354	Niagara River.
12	Cincinnati, Ohio	Water consumption	36,072,376	44,153,296	24,765,574	123	Ohio River.
13	Milwaukee, Wis.	Pumpage of water	40,000,000	55,000,000	35,000,000	114	Lake Michigan.
14	Newark, N. J.	Pumpage of sewage and water consumption.	40,000,000	(1)	(1)	154	Newark Bay (40 per cent), Passaic River (54 per cent), Arthur Kill (6 per cent).
15	New Orleans, La.	Pumpage of sewage	*12,500,000*	*13,000,000*	*12,000,000*	125	Sewage into Mississippi River. Storm water into Lake Pontchartrain.
16	Washington, D. C.	Pumpage of sewage	*69,000,000*	*70,500,000*	*65,500,000*	230	Potomac River.
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.						
17	Minneapolis, Minn.	Metered water consumption	9,000,000	(1)	7,611,240	61	Mississippi River.
18	Los Angles, Cal.	Measurement of flow at outfall	15,000,000	21,000,000	7,000,000	73	Pacific Ocean.
19	Jersey City, N. J.	Water consumption	*40,000,000*	(1)	(1)	182	Hackensack and Hudson Rivers, Newark and New York Bays.
20	Kansas City, Mo.	Water consumption	24,149,317	28,777,600	19,719,355	114	Missouri River.
21	Indianapolis, Ind.	Capacity of sewers and observation of outfall.	112,500,000	200,000,000	25,000,000	500	White River.
22	Louisville, Ky.	Pumpage of water	35,000,000	48,000,000	22,000,000	269	Ohio River.
24	Providence, R. I.	Measurement of overfall at weirs	*19,791,000*	*38,645,000*	*9,820,000*	102	Providence River.
25	Rochester, N. Y.	Measurement of overfall at weirs and gauged water consumption.	21,585,484	*27,918,950*	*15,898,291*	103	Genesee River.
26	St. Paul, Minn.	Water consumption	8,000,000	17,000,000	6,000,000	94	Mississippi River.
27	Denver, Colo.	Measurements at outlet	30,000,000	36,000,000	24,000,000	200	South Platte River.
28	Portland, Oreg.	Water consumption	15,000,000	17,500,000	10,500,000	86	Willamette River.
29	Columbus, Ohio	Metered pumpage of sewage	*11,100,000*	*21,400,000*	*3,100,000*	74	Scioto River.
31	Worcester, Mass.	Flow through a measuring chamber	*14,430,000*	*24,838,800*	*7,960,400*	114	Blackstone River.
32	Atlanta, Ga.	Measurement of discharge	8,317,728	12,476,952	4,158,864	104	Chattahoochee and South Rivers.
33	Syracuse, N. Y.	Water consumption	15,000,000	(1)	(1)	124	Harbor Brook and Onondaga Creek.
34	New Haven, Conn.	Water consumption	3,500,000	4,000,000	3,000,000	35	Long Island Sound.
36	Paterson, N. J.	Gauge of the flow	33,000,000	44,000,000	*20,000,000*	244	Passaic River.
37	Omaha, Nebr.	Capacity of the outlets	30,000,000	36,936,000	15,000,000	300	Missouri River and Saddle Creek.
39	Memphis, Tenn.	Water consumption	12,600,000	14,000,000	11,200,000	124	Mississippi and Wolf Rivers.
40	Richmond, Va.	Pumpage of water	14,969,801	19,626,577	17,348,000	156	James River.
42	Grand Rapids, Mich.	Sewer capacity and water consumption.	16,000,000	20,000,000	12,000,000	200	Grand River.
43	Nashville, Tenn.	Water consumption	13,500,000	15,000,000	12,000,000	193	Cumberland River.
46	Dayton, Ohio	Capacity of sewers and depth of flow	8,000,000	10,000,000	7,000,000	158	Great Miami River.

[1] Not reported.

TABLE 7.—SEWERS—DISCHARGE OF SEWAGE: 1909—Continued.

[Cities having no record, and making no estimates of volume of sewage, are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 29. All figures not printed in italics are estimates.]

City number.	CITY.	VOLUME OF SEWAGE DISCHARGED.					Stream or body of water into which sewage is discharged.
		Estimate of discharge based on—	Daily during year (gallons).				
			Average.	Maximum.	Minimum.	Average per person served.	
		GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.					
47	Albany, N. Y.	Water consumption	20,000,000	23,000,000	17,000,000	209	Hudson River.
48	Bridgeport, Conn.	Water consumption	22,000,000	24,000,000	20,000,000	244	Pequonnock River.
50	Hartford, Conn.	Water consumption	6,810,000	(1)	(1)	70	Connecticut River.
51	Reading, Pa.	Pumpage of sewage	*3,000,000*	(1)	(1)	42	Schuylkill River.
52	Trenton, N. J.	Velocity and depth of flow	15,500,000	30,000,000	12,000,000	258	Delaware River.
53	San Antonio, Tex.	Measurement of flow	15,000,000	19,848,685	12,000,000	222	Mitchell Lake.
54	New Bedford, Mass.	Water consumption	7,472,129	12,741,680	4,267,800	83	Acushnet River and Buzzards Bay.
55	Camden, N. J.	Water consumption	6,000,000	(1)	(1)	133	Delaware River and Cooper Creek.
56	Dallas, Tex.	Water consumption	5,500,000	8,000,000	3,000,000	113	Trinity River.
57	Salt Lake City, Utah	Pumpage of sewage and measurement of flow.	9,000,000	9,500,000	8,500,090	138	Jordan River.
58	Lynn, Mass.	Water consumption	6,394,209	(1)	(1)	77	Lynn Harbor.
59	Wilmington, Del.	Water consumption	6,000,000	(1)	(1)	100	Christiana and Brandywine Creeks.
60	Springfield, Mass.	Water consumption	6,500,000	(1)	15,000,000	79	Connecticut River.
63	St. Joseph, Mo.	Water consumption	7,280,179	11,340,500	4,017,000	103	Missouri River.
64	Troy, N. Y.	Water consumption	15,000,000	(1)	9,000,000	214	Hudson River.
65	Yonkers, N. Y.	Water consumption	7,555,297	(1)	(1)	126	Hudson River.
66	Tacoma, Wash.	Water consumption	3,000,000	(1)	(1)	49	Puget Sound.
67	Youngstown, Ohio.	Water consumption	(1)	(1)	7,000,000	....	Mahoning River.
68	Duluth, Minn.	Water consumption	775,000	(1)	(1)	14	St. Louis Bay and Lake Superior.
69	Houston, Tex.	Pumpage of water	5,500,000	8,000,000	3,500,000	170	Buffalo Bayou.
70	Somerville, Mass.	Water consumption	6,331,000	(1)	(1)	83	Mystic and Miller Rivers and Boston Harbor.
71	Kansas City, Kans.	Water consumption	7,560,000	9,240,000	6,720,000	114	Jersey Creek, Kansas and Missouri Rivers.
73	Waterbury, Conn.	Water consumption	10,500,000	13,000,000	8,500,000	233	Naugatuck River.
74	Elizabeth, N. J.	Water consumption	5,800,000	7,000,000	4,500,000	89	Elizabeth River.
75	Schenectady, N. Y.	Water consumption	10,000,000	18,000,000	9,000,000	147	Mohawk River.
76	Hoboken, N. J.	Water consumption	5,000,000	(1)	(1)	96	Hudson River.
77	Manchester, N. H.	Pumpage of water	4,250,000	4,500,000	4,000,000	71	Merrimac and Piscataquog Rivers.
78	Evansville, Ind.	Water consumption	9,500,000	13,000,000	6,000,000	413	Ohio River and Pigeon Creek.
79	Birmingham, Ala.	1905 record allowing for increase of sewers.	6,500,000	7,000,000	5,500,000	144	Village and Valley Creeks.
80	Akron, Ohio.	Metered water consumption	9,000,000	11,000,000	7,000,000	225	Little Cuyahoga River.
81	Norfolk, Va.	Water consumption	7,359,783	8,793,600	6,358,000	175	Elizabeth River.
82	Fort Worth, Tex.	Estimate by engineer	8,000,000	9,000,000	7,000,000	172	Trinity River.
84	Erie, Pa.	Measurement of dry-weather flow	11,320,720	13,410,000	7,793,280	189	Presque Isle Bay.
86	Peoria, Ill.	Water consumption and observation of flow.	45,000,000	60,000,000	30,000,000	750	Illinois River.
87	Harrisburg, Pa.	Estimate by engineer	9,000,000	(1)	(1)	180	Paxton Creek.
88	Fort Wayne, Ind.	Water consumption	2,772,000	(1)	(1)	66	Maumee River.
89	Charleston, S. C.	Pumpage of sewage	1,152,000	(1)	(1)	77	Cooper and Ashley Rivers.
91	Terre Haute, Ind.	Pumpage of water	2,000,000	(1)	(1)	57	Wabash River.
92	East St. Louis, Ill.	Pumpage of water	10,000,000	12,000,000	8,000,000	222	Cahokia Creek (empties into Mississippi River).
93	Holyoke, Mass.	Water consumption	5,600,000	8,700,000	5,000,000	102	Connecticut River.
94	Brockton, Mass.	Pumpage of sewage	*3,247,900*	*3,892,100*	*2,843,400*	81	Cohasset River.
96	Jacksonville, Fla.	Occasional measurements of flow	2,000,000	2,100,000	1,900,000	50	St. Johns River.
98	Bayonne, N. J.	Estimate by city official	1,800,000	2,100,000	1,500,000	56	Newark Bay.
99	Covington, Ky.	Water consumption	2,780,000	2,940,000	2,414,000	79	Ohio and Licking Rivers.
100	South Bend, Ind.	Water consumption	2,800,000	(1)	(1)	100	St. Joseph River.
101	Passaic, N. J.	Population and gauge of flow	5,500,000	6,000,000	5,000,000	138	Passaic River.
102	Altoona, Pa.	Estimate of city official	5,000,000	(1)	(1)	111	Little Juniata River.
105	Pawtucket, R. I.	Sewage handled by filtration plant	3,000,000	6,000,000	2,000,000	75	Blackstone and Moshassuck Rivers.

---

[1] Not reported.

TABLE 7.—SEWERS—DISCHARGE OF SEWAGE: 1909—Continued.

[Cities having no record, and making no estimates of volume of sewage, are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 29. All figures not printed in italics are estimates.]

City number.	CITY.	VOLUME OF SEWAGE DISCHARGED.					Stream or body of water into which sewage is discharged.
		Estimate of discharge based on—	Daily during year (gallons).				
			Average.	Maximum.	Minimum.	Average per person served.	
		GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.					
107	Canton, Ohio	Flow of sewage over weirs	*2,430,000*	*2,628,000*	*2,628,000*	76	Nimischillen Creek.
108	Wichita, Kans	Water consumption	4,000,000	6,000,000	3,000,000	133	Arkansas River.
109	Springfield, Ill	Pumpage of water	7,000,000	10,000,000	5,500,000	250	Sangamon River.
110	Binghamton, N. Y	Pumpage of water	4,000,000	6,210,000	2,000,000	100	Susquehanna and Chenango Rivers.
113	Little Rock, Ark	Water consumption	2,640,000	2,880,000	2,400,000	69	Arkansas River and Fourche Bayou.
114	Springfield, Ohio	Water consumption	2,968,812	3,392,928	1,399,583	165	Lagonda Creek and Mad River.
117	Rockford, Ill	Pumpage of water	2,710,102	(1)	(1)	97	Rock River.
119	Lincoln, Nebr	Water consumption	2,000,000	3,000,000	1,000,000	57	Salt Creek.
120	Chattanooga, Tenn	Area served and velocity of flow	5,832,000	6,480,000	5,184,000	153	Tennessee River and Chattanooga Creek.
121	Topeka, Kans	1907 report allowing for increase	2,400,000	2,640,000	1,800,000	96	Kaw River.
122	Sacramento, Cal	Pumpage of sewage and of water	30,000,000	72,000,000	10,000,000	857	Sacramento River.
123	Malden, Mass	Water consumption	10,800,000	(1)	(1)	321	Boston Harbor.
125	Pueblo, Colo	Pumpage of water	7,497,020	10,580,690	5,559,210	214	Arkansas and Fountain Rivers.
126	Salem, Mass	Metered pumpage of sewage	*2,240,421*	*2,629,290*	*1,633,894*	(2)	Atlantic Ocean.
127	New Britain, Conn	Weir reading at purification works	*6,000,000*	*7,000,000*	*5,000,000*	171	Mattabessett River.
129	McKeesport, Pa	Water consumption	4,742,500	(1)	(1)	136	Monongahela and Youghiogheny Rivers.
130	Wheeling, W. Va	Water consumption	13,200,000	17,600,000	10,100,000	330	Ohio River and Wheeling Creek.
131	Augusta, Ga	Estimate of city official	1,850,000	1,900,000	1,800,000	53	Savannah River.
132	Superior, Wis	Pumpage of water	1,600,000	(1)	(1)	50	Superior Bay and St. Louis River.
133	Newton, Mass	Estimate of engineer	3,000,000	6,000,000	1,066,000	97	Boston Harbor through Metropolitan system.
134	Dubuque, Iowa	Water consumption	900,000	1,100,000	800,000	31	Mississippi River.
137	Kalamazoo, Mich	Pumpage of water	1,500,000	2,000,000	1,000,000	75	Kalamazoo River.
138	Montgomery, Ala	Water consumption	2,790,000	(1)	(1)	93	Alabama River.
139	Woonsocket, R. I	Pumpage of sewage	*800,000*	*1,200,000*	*505,000*	42	Blackstone River.
140	Galveston, Tex	Water consumption	1,350,000	1,500,000	1,200,000	42	Galveston Bay and Gulf of Mexico.
141	Fitchburg, Mass	Measurement at weir at dry flow period.	3,000,000	3,500,000	2,800,000	115	Nashua River.
143	Elmira, N. Y	Pumpage of water	3,000,000	10,000,000	2,250,000	86	Chemung River.
144	Quincy, Ill	Water consumption	1,500,000	1,750,000	1,000,000	100	Mississippi River
145	Knoxville, Tenn	Water consumption	5,160,000	5,800,000	4,520,000	161	Tennessee River.
146	New Castle, Pa	Depth and velocity of flow	5,500,000	20,000,000	5,000,000	183	Shenango River.
148	Auburn, N. Y	Water consumption	6,591,423	7,784,000	5,252,000	235	Owasco River.
149	West Hoboken, N. J	Wates consumption	1,000,000	(1)	(1)	33	Hudson and Hackensack Rivers.
150	Joliet, Ill	Pumpage of water	3,600,000	(1)	(1)	180	Des Plaines River, Hickory Creek, and Chicago Canal.
151	Taunton, Mass	Occasional measurements of flow	650,000	1,000,000	500,000	65	Taunton River.
152	Everett, Mass	Water consumption	2,600,000	(1)	(1)	81	Boston Harbor.
154	Chelsea, Mass	Water consumption	2,860,000	(1)	(1)	89	Boston Harbor.
155	Joplin, Mo	Capacity of sewers and population served.	1,200,000	3,000,000	600,000	60	Turkey Creek.
157	Newport, Ky	Water consumption	2,066,820	2,580,000	1,764,150	138	Ohio and Licking Rivers.

[1] Not reported.

[2] No data for computation reported.

TABLE 8.—SEWERS—PUMPING OF SEWAGE: 1909.

[Only cities that pump sewage are included in this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 30. Figures printed in italics are estimates.]

City number.	CITY.	SEWAGE PUMPED DURING YEAR.				Daily capacity of pumps (gallons).	Average static head against which pumps work (feet).	Kind of power used in pumping.	Average number of employees at pumping station.	EXPENSES OF PUMPING STATION FOR YEAR.	
		Total quantity (millions of gallons).	Per cent of total discharge.	Million gallons (average) per— Day.	Million gallons (average) per— Employee at pumping station.					Total.	Per million gallons raised 1 foot.
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.										
1	New York, N. Y.	5,175	(1)	14.18	....	29,000,000	....	Steam	(2)	(1)	....
	Brooklyn Borough	4,724	9.5	12.94	....	26,500,000	12	Steam	(2)	(1)	....
	Queens Borough	451	(1)	1.24	....	2,500,000	25 and 30	Steam	(2)	$38,929	....
2	Chicago, Ill.	39,320	(1)	107.73	666.44	1,015,000,000	8	Steam and gas	59	104,136	$0.33
5	Boston, Mass.	36,917	90.9	101.14	512.74	192,000,000	37	Steam	72	78,423	0.06
9	Detroit, Mich.	(1)	6.0	....	....	18,000,000	20	(1)	4	5,365	....
10	Buffalo, N. Y.	4,000	8.0	10.96	400.00	58,168,519	20	Steam	10	1,240	0.02
11	San Francisco, Cal.	10	*0.3*	0.03	3.33	1,008,000	18	Electric	3	(1)	....
13	Milwaukee, Wis.	[3] 224,168	(1)	614.16	5,337.34	141,400,000	(4)	(1)	42	61,530	....
14	Newark, N. J.	5,377	*40.0*	14.73	597.47	30,000,000	16	Steam	9	15,073	0.18
15	New Orleans, La.	(1)	100.0	....	....	*22,000,000*	50	Electric	30	50,000	....
16	Washington, D. C.	23,748	94.0	65.06	791.59	735,000,000	16	Steam	30	43,000	0.12
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.										
24	Providence, R. I.	6,819	92.0	18.68	524.57	105,000,000	27	Steam	13	$19,759	$0.11
26	St. Paul, Minn.	(1)	1.0	....	....	(1)	24	Electric	1	1,200	....
29	Columbus, Ohio	3,849	95.0	10.54	296.07	16,000,000	25 and 60	Steam and gas	13	24,200	....
31	Worcester, Mass.	41	5.0	0.11	20.63	1,065,600	(5)	Electric	2	5,008	....
39	Memphis, Tenn.	50	1.1	0.14	24.80	1,008,000	70	Electric	2	3,406	0.97
42	Grand Rapids, Mich.	(1)	(1)	....	....	1,536,000	7	Electric	6	550	....
46	Dayton, Ohio	150	3.5	0.41	150.00	25,344,000	18	Electric	1	500	0.19
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.										
50	Hartford, Conn.[6]	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
51	Reading, Pa.	1,095	50.0	3.00	182.50	20,000,000	40	Steam	6	$40,000	$0.91
57	Salt Lake City, Utah	1,085	33.3	2.97	271.25	(1)	34	Electric and gas	4	(1)	....
58	Lynn, Mass.	(1)	(1)	....	....	14,400,000	(1)	Electric	1	133	....
69	Houston, Tex.	2,008	100.0	5.50	401.50	15,307,200	16	Steam	5	11,587	0.36
81	Norfolk, Va.	2,598	95.0	7.12	199.82	65,000,000	24 and 25	Steam and electric	13	21,555	....
89	Charleston, S. C.	420	100.0	1.15	140.16	(1)	25	Electric	3	2,994	0.29
92	East St. Louis, Ill.	*1,217*	33.3	3.33	405.56	14,000,000	19	Steam and electric	3	*3,630*	0.16
94	Brockton, Mass.	1,185	100.0	3.25	395.09	5,000,000	38	Steam	3	5,056	0.11
96	Jacksonville, Fla.	237	33.3	0.65	237.25	(1)	50	Electric	1	2,780	0.23
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.										
106	Saginaw, Mich.[7]	(1)	(1)	....	....	5,846,400	12	Electric	....	$146	....
112	Sioux City, Iowa	(1)	(1)	....	....	(1)	25	Steam	1	1,000	....
122	Sacramento, Cal.	10,950	100.0	30.00	1,095.00	72,000,000	17	Steam	10	22,224	$0.12
126	Salem, Mass.	1,546	90.0	4.24	515.29	28,000,000	14	Electric	3	7,600	0.35
133	Newton, Mass.	12	1.0	0.03	11.55	432,000	29	Gasoline	1	(1)	....
139	Woonsocket, R. I.	250	100.0	0.68	125.00	5,760,000	24	Steam	2	3,655	0.61

[1] Not reported.

[2] Reported with employees of another department.

[3] Includes principally pumpage of water from Lake Michigan into rivers to flush out mouths of rivers receiving sewage.

[4] 2.78 feet Milwaukee River; 3.08 feet Kinnikinnick River; 13.50 feet Menominee River.

[5] 9.40 feet Station 1; 41.75 feet Station 2; 185.30 (3 lifts) feet Station 3; 63.20 feet Station 4.

[6] Small pumping station for pumping sewage when the river is high. The station is not often used.

[7] Small pumping station for pumping storm water in emergency.

TABLE 9.—SEWERS—SEWAGE-PURIFICATION SYSTEMS: 1909.

[Cities having no sewage purification systems are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 31. Figures printed in italics are estimates.]

City number.	CITY.	AVERAGE DAILY QUANTITY (GALLONS) OF SEWAGE TREATED.		Sewer systems for which sewage was purified.	Sewage pumped.	Apparatus for preliminary process.	TANKS.		FILTERS.		Body of water into which effluent is discharged.
		Total.	Per cent of total for city.				Kind.	Number.	Kind.	Number.	
1	New York, N. Y.: Brooklyn Borough	12,937,500	8.6	Combined	Yes	Screens	Chemical precipitation.	4	...	...	Jamaica, Sheepshead, and Gravesend Bays.
	Queens Borough	*4,750,000*	16.8	(1)	Yes	Screens and grit chambers.	Chemical precipitation and settling.	4	Sand filter	3	Jamaica Bay.
24	Providence, R. I.	19,257,233	97.3	Combined	Yes	Screens and grit chambers.	Chemical precipitation.	20	...	...	Providence River.
26	St. Paul, Minn.	20,000	0.2	Sanitary	Yes	...	Septic	1	...	...	Mississippi River.
28	Portland, Oreg.	18,000	0.1	Combined	No	...	Septic	2	...	...	Tributary of Willamette River.
29	Columbus, Ohio	21,800,000	100.0	Both	Yes	Screens	Settling and septic	8	Sprinkling filter	4	Scioto River.
31	Worcester, Mass.	14,368,000	99.5	Both	Yes	Screens and grit chambers.	Settling, septic, and chemical precipitation.	[3] 16	Sand filter	66	Blackstone River.
37	Omaha, Nebr.	150,000	0.5	(1)	No	Screens	Septic	1	...	...	Saddle Creek.
51	Reading, Pa.	6,000,000	100.0	Combined	Yes	Screens	Settling	1	Sprinkling filter	2	Schuylkill River.
61	Des Moines, Iowa	200,000	(1)	(1)	No	...	Septic	2	Sand filter	2	Des Moines and Raccoon Rivers.
69	Houston, Tex.	5,500,000	100.0	Both	Yes	Screens	...	...	Sand filter	18	Buffalo Bayou.
80	Akron, Ohio	30,000	0.3	Sanitary	No	...	...	...	Sand filter	2	Little Cuyahoga River.
94	Brockton, Mass.	3,247,300	100.0	Sanitary	Yes	Screens	...	...	Sand filter	37	Cohasset River.
102	Altoona, Pa.	960,000	19.2	Sanitary	No	...	...	...	Sand filter	40	Little Juniata River.
105	Pawtucket, R. I.	264,368	8.8	Combined	No	Screens	Settling	2	Sand filter	16	Mohassuck River.
107	Canton, Ohio	(1)	(1)	Sanitary	No	...	Settling	4	...	...	Nimischillen Creek.
113	Little Rock, Ark.	40,000	1.5	Sanitary	No	Grit chambers	Settling	5	...	...	Fourche Bayou.
127	New Britain, Conn.	6,000,000	100.0	Sanitary	No	Screens	Settling	2	Sand filter	33	Willow Brook.
139	Woonsocket, R. I.	800,000	100.0	Sanitary	Yes	Screens	...	...	Sand filter	5	Blackstone River.
148	Auburn, N. Y.	[2] 500,000	7.6	Sanitary	No	Screens and grit chambers.	Septic	2	Contact	4	Owasco River.

[1] Not reported.

[2] Plant in operation only a few days.

[3] Includes 1 septic and 1 settling tank used for experimental purposes.

TABLE 10.—SEWERS—SEWAGE PURIFICATION IN TANKS: 1909.

[Cities having no sewage purification tanks are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 31. Figures printed in italics are estimates.]

City number.	CITY.	TANKS.			Average quantity (gallons) of sewage treated daily.	Average detention period (hours).	SLUDGE.		COST OF—				
									Construction.		Operation.		
		Kind.	Number.	Capacity (gallons).			Amount (cubic yards) per million gallons of sewage treated.	Frequency of removal.	Total.	Per million gallons capacity.	Total.	Per million gallons treated.	Per 1,000 contributing population.
1	New York, N. Y.:												
	Brooklyn Borough..	Chemical precipitation.	4	500,000	12,937,500	0.7 to 1.0	20.0	Weekly..........	....	....	(1)	....	....
	Queens Borough....	Chemical precipitation and settling.	4	832,500	3,500,000	6.5	2.5	Every 3 weeks....	$108,870	$130,775	$33,500	$26.22	$223.33
24	Providence, R. I.......	Chemical precipitation.	20	11,130,000	19,257,233	4.0	20.2	Weekly..........	209,481	18,821	60,286	8.58	310.75
31	Worcester, Mass.......	Chemical precipitation.	[2]16	5,000,000	10,100,000	5 to 10	21.2	3 to 8 weeks.......	265,629	53,126	34,660	9.40	273.99
26	St. Paul, Minn........	Septic..........	1	40,000	20,000	24.0	(1)	Once in 3 years....	4,200	105,000	(1)	....	....
28	Portland, Oreg........	Septic..........	2	20,000	18,000	24.0	(1)	Once per year.....	407	....	50	....	....
29	Columbus, Ohio........	Septic..........	[3]8	12,020,000	11,100,000	(4)	(1)	5 times per year...	80,000	9,975	(1)	....	....
37	Omaha, Nebr..........	Septic..........	1	(1)	150,000	8.0	2.0	6 times per year...	12,000	....	600	....	....
61	Des Moines, Iowa.....	Septic..........	2	40,000	100,000	10.0	0.3	2 times per year...	(1)	....	*800*	....	....
148	Auburn, N. Y........	Septic..........	2	500,000	*250,000*	6.0	(1)	Every 5 weeks....	(1)	....	(1)	....	....
51	Reading, Pa..........	Settling........	1	1,500,000	3,000,000	12.0	4.6	Every 6 weeks....	(1)	....	(1)	....	....
105	Pawtucket, R. I.......	Settling	2	66,000	264,368	6 to 8	10.0	Weekly..........	(1)	....	(1)	....	....
107	Canton, Ohio..........	Settling	4	718,130	(1)	(1)	(1)	Every 4 months...	(1)	....	508	....	....
113	Little Rock, Ark......	Settling	5	115,000	*40,000*	48.0	(1)	4 times per year...	3,500	30,435	80	....	....
127	New Britain, Conn....	Settling	2	200,000	6,000,000	0.8	35.0	Weekly..........	2,000	10,000	(1)	....	....

[1] Not reported.
[2] Includes 1 septic and 1 settling tank for experimental purposes.
[3] Includes 4 primary septic tanks (cubic content, 710,000 gallons each), 2 secondary septic tanks (cubic content, 2,590,000 gallons each), and 2 settling tanks for settling sewage after it has passed through sprinkling filters (cubic content, 2,000,000 gallons each).
[4] From 6.5 to 16 hours.

TABLE 11.—SEWERS—SEWAGE PURIFICATION IN FILTERS: 1909.

[Cities having no purification beds are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 32. Figures printed in italics are estimates.]

City number.	CITY.	Kind of filters.	Date of construction.	Number of filters.	Area of filters (acres).	Depth of filtering material (inches).	DOSING.		QUANTITY (GALLONS) TREATED DAILY.			Per cent of suspended solids removed.	EXPENSES OF OPERATION.		
									Average.						
							Hours per dose.	Times per month.	Total.	Per acre of beds.	Maximum.		Total.	Per million gallons treated.	Per acre of beds.
1	New York, N. Y.:														
	Queens Borough....	Sand filter.	1905	3	1.00	(1)	(2)	....	1,250,000	1,250,000	1,500,000	85	$15,000	$32.88	$15,000.00
31	Worcester, Mass......	Sand filter.	1899-1909	66	65.20	(3)	2 to 6	4 to 16	4,268,000	65,460	13,450,000	100	15,233	9.77	233.63
61	Des Moines, Iowa.....	Sand filter.	1906-1907	2	0.44	36	10	36	*100,000*	227,273	(4)	(4)	*1,200*	32.88	2,727.27
69	Houston, Tex.........	Sand filter.	(4)	[5]18	20.61	(6)	(7)	(7)	5,500,000	266,861	8,000,000	(4)	7,878	3.92	382.24
80	Akron, Ohio..........	Sand filter.	1907	2	0.26	34	2	180	*30,000*	115,385	*40,000*	(4)	(4)	....	....
94	Brockton, Mass.......	Sand filter.	1894	37	37.00	(8)	6	10	3,247,300	87,765	3,892,100	80	7,370	6.21	199.19
102	Altoona, Pa..........	Sand filter.	1896	40	70.00	36	9	(4)	*960,000*	13,714	(4)	(4)	600	1.71	8.57
105	Pawtucket, R. I......	Sand filter.	1894	16	3.36	60	2 to 6	15	137,145	40,817	216,403	85	5,999	119.74	1,785.41
127	New Britain, Conn....	Sand filter.	1901	33	37.00	48	17	8	6,000,000	162,162	7,000,000	60	7,415	3.39	200.41
139	Woonsocket, R. I.....	Sand filter.	1895	5	4.00	60	6	6	*800,000*	200,000	*1,200,000*	88	3,502	11.99	875.50
29	Columbus, Ohio......	Sprinkling filter.	1906-1908	4	10.00	64	....	....	10,700,000	1,070,000	21,400,000	18	8,500	2.18	850.00
51	Reading, Pa..........	Sprinkling filter.	(9)	2	2.00	60	....	....	3,000,000	1,500,000	(4)	50	40,000	36.53	20,000.00
148	Auburn, N. Y.........	Contact....	1909	4	2.00	48	(10)	90	[11]250,000	125,000	1,000,000	(4)	(4)	....	....

[1] From 48 to 60 inches.
[2] Flows continuously.
[3] From 48 to 72 inches.
[4] Not reported.
[5] Includes 6 coke and gravel beds and 12 sand beds.
[6] Coke and gravel beds, 14 inches (coke 6 inches, gravel 8 inches); sand beds, 12 inches.
[7] Sewage flows on beds continuously; coke and gravel beds rested and cleaned every 2 weeks; sand beds rested for 2 days every 6 weeks.
[8] From 84 to 96 inches.
[9] Slag bed built in 1907; stone bed begun in 1908, not completed.
[10] Filling, 2 hours; standing full, 2 hours; emptying, 1 hour; standing empty, 3 hours.
[11] Plant in operation but a few days.

TABLE 12.—REFUSE DISPOSAL—QUANTITY OF GARBAGE, ASHES, AND RUBBISH COLLECTED, NUMBER OF EMPLOYEES ENGAGED IN SERVICE, AND EXPENSES OF COLLECTION AND DISPOSAL: 1909.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 39. Figures printed in italics are estimates.]

City number.	CITY.	QUANTITY COLLECTED DURING YEAR (CUBIC YARDS).							NUMBER OF EMPLOYEES.						EXPENSES OF COLLECTION AND DISPOSAL.		
		All refuse.				Garbage.	Ashes.	Rubbish.	Total.	City employees.	Contractors.	Per 10,000 inhabitants.	Per 10,000 cubic yards collected by—		Total.	Per 1,000 inhabitants.	Per 1,000 cubic yards collected.
		Total.	Collected by—		Per 1,000 inhabitants.												
			City employees.	Contractors.									City employees.	Contractors.			
	Grand total	19,264,373	13,913,236	5,351,137	843	5,348,024	10,562,302	3,354,047	12,450	8,396	4,054	5.5	6.0	7.6	7,781,879	$340.72	$403.95
	Group I	13,254,172	9,699,881	3,554,291	958	2,575,593	7,856,133	2,822,446	8,424	5,484	2,940	6.1	5.7	8.3	4,709,060	340.46	355.29
	Group II	3,115,025	2,078,744	1,036,281	709	1,537,906	1,375,195	201,924	1,941	1,419	522	4.4	6.8	5.0	1,439,656	327.58	462.17
	Group III	2,175,513	1,645,155	530,358	648	903,862	1,044,164	227,487	1,550	1,163	387	4.6	7.1	7.3	1,240,270	369.36	570.10
	Group IV	719,663	489,456	230,207	573	330,663	286,810	102,190	535	330	205	4.3	6.7	8.9	392,893	312.95	545.94
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.																
1	New York, N. Y	5,674,319	5,667,825	6,494	1,226	[1] 660,881	2,788,872	2,224,566	2,869	[2] 2,680	189	6.2	4.7	290.8	(3)	(3)	(3)
2	Chicago, Ill	1,420,728	1,420,728	......	663	186,536	1,234,192	(4)	999	[2] 852	[5] 147	4.7	[6] 7.0	......	$1,231,205	$574.75	$866.60
3	Philadelphia, Pa	1,569,487	......	1,569,487	1,028	651,360	810,347	107,780	939	(7)	939	6.2	......	6.0	[8] 488,588	320.09	311.30
4	St. Louis, Mo	81,523	81,523	......	120	81,523	......	......	176	176	......	2.6	21.6	......	[8] 170,452	251.73	2,090.92
5	Boston, Mass	898,435	683,047	215,388	1,367	105,595	692,865	99,975	597	565	32	9.1	8.3	1.4	631,311	960.45	702.68
6	Baltimore, Md	550,386	550,386	......	993	152,608	397,778	(4)	249	[2] 235	[5] 14	4.5	[6] 4.5	1	236,507	426.83	429.71
7	Cleveland, Ohio	286,764	286,764	......	533	71,344	202,752	[9] 12,668	304	304	......	5.6	10.6	......	313,050	581.48	1,091.68
8	Pittsburgh, Pa	163,849	27,845	136,004	311	136,004	......	27,845	381	(10)	381	7.2	......	28.0	[8] 251,657	476.90	1,535.90
9	Detroit, Mich	241,387	241,387	......	539	50,260	191,127	(4)	173	173	......	3.9	7.2	......	[11] 61,209	136.79	253.57
10	Buffalo, N. Y	496,285	......	496,285	1,195	50,564	266,456	179,265	468	[12] 63	405	11.3	......	[13] 9.4	272,075	655.11	548.23
12	Cincinnati, Ohio	276,328	222,634	53,694	767	53,694	222,634	(4)	317	117	200	8.8	5.3	37.2	[8] 207,633	576.04	751.40
13	Milwaukee, Wis	*299,742*	*299,742*	......	835	*82,742*	*217,000*	(4)	158	158	......	4.4	5.3	......	300,527	836.98	1,002.63
14	Newark, N. J	717,995	......	717,995	2,137	38,706	671,054	[9] 8,235	353	[12] 13	340	10.5	......	[13] 4.9	195,339	581.45	272.06
15	New Orleans, La	218,000	218,000	......	652	181,666	......	36,334	140	140	......	4.2	6.4	......	169,635	507.17	778.14
16	Washington, D. C	358,944	......	358,944	1,100	72,110	161,056	125,778	301	[2, 12] 8	293	9.2	......	[13] 8.4	179,872	551.03	501.12
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.																
17	Minneapolis, Minn	54,531	54,531	......	185	36,807	17,724	......	61	61	......	2.0	11.2	......	$61,486	$208.89	$1,127.56
18	Los Angeles, Cal	*63,875*	*63,875*	......	220	*48,667*	*5,069*	10,139	[2] 44	44	......	1.5	6.9	......	47,727	164.08	747.14
19	Jersey City, N. J	509,207	......	509,207	1,947	509,207	(14)	(14)	83	......	83	3.2	......	1.6	48,038	183.72	94.34
20	Kansas City, Mo	56,428	......	56,428	233	56,428	......	......	55	[13] 10	45	2.3	......	[13] 9.8	51,724	213.94	916.60
21	Indianapolis, Ind	*158,910*	......	*158,910*	695	*48,000*	*100,000*	*10,910*	132	[12] 1	131	5.8	......	[13] 8.3	87,617	383.12	551.36
22	Louisville, Ky	*91,352*	*91,352*	......	411	[15] 51,304	*22,500*	[9] *17,548*	124	124	......	5.6	13.6	......	93,606	421.10	1,024.70
24	Providence, R. I	*32,415*	......	*32,415*	148	*32,415*	......	......	49	[12] 1	48	2.2	......	[13] 15.1	27,590	125.57	851.02
25	Rochester, N. Y	387,937	321,608	66,329	1,833	66,329	321,608	(4)	225	[2] 167	58	10.6	5.2	8.7	189,606	895.80	488.75
26	St. Paul, Minn	19,320	19,320	......	91	19,320	......	......	27	27	......	1.3	14.0	......	24,776	117.11	1,282.40
27	Denver, Colo	80,392	......	80,392	388	80,392	......	......	69	[12] 6	63	3.3	......	[13] 8.6	[16] 4,848	......	......
29	Columbus, Ohio	*30,000*	*30,000*	......	178	*30,000*	......	......	51	51	......	3.0	17.0	......	39,947	237.28	1,331.57
30	Toledo, Ohio	29,553	29,553	......	179	12,375	17,178	(4)	22	[2] 22	......	1.3	7.4	......	28,595	173.04	967.68
31	Worcester, Mass	13,522	13,522	......	95	13,522	......	......	51	51	......	3.6	37.7	......	37,638	263.50	2,783.88
32	Atlanta, Ga	324,271	324,271	......	2,386	324,271	(14)	(14)	248	248	......	18.2	7.6	......	143,730	1,057.46	443.24
33	Syracuse, N. Y	134,660	134,660	......	1,007	23,264	111,396	(4)	80	80	......	6.0	5.9	......	68,619	513.12	509.57
34	New Haven, Conn	*27,000*	......	*27,000*	206	*27,000*	......	......	28	......	28	2.1	......	13.7	13,950	106.21	516.67
35	Scranton, Pa	113,725	113,725	......	892	8,155	105,570	......	54	54	......	4.2	4.7	......	22,012	172.63	193.56
36	Paterson, N. J	*100,600*	......	*100,600*	817	*14,400*	*80,000*	*6,200*	24	[12] 1	23	1.9	......	[13] 2.3	37,158	301.90	369.36
38	Fall River, Mass	*55,495*	*50,495*	*5,000*	475	*5,000*	50,495	(4)	39	24	15	3.3	4.8	30.0	40,876	349.64	736.50
39	Memphis, Tenn	76,690	76,690	......	657	28,780	47,910	(4)	94	94	......	8.1	12.3	......	64,719	554.53	843.90
40	Richmond, Va	*216,170*	*216,170*	......	1,862	11,286	*115,180*	91,704	69	69	......	5.9	3.2	......	54,628	470.73	252.71
42	Grand Rapids, Mich	69,625	69,625	......	633	24,000	9,125	36,500	40	40	......	3.6	5.7	......	38,241	347.46	549.28
43	Nashville, Tenn	204,636	204,636	......	1,867	15,056	184,092	5,488	41	41	......	3.7	2.0	......	46,815	427.07	228.77
44	Lowell, Mass	43,836	43,836	......	421	9,707	34,129	......	50	50	......	4.8	11.4	......	40,896	392.66	932.85
45	Cambridge, Mass	149,231	149,231	......	1,441	26,330	99,466	23,435	92	92	......	8.9	6.2	......	79,921	771.96	535.56
46	Dayton, Ohio	71,644	71,644	......	714	15,891	55,753	(4)	89	61	[5] 28	8.9	[6] 12.4	......	44,893	447.45	626.65

[1] Includes 72,855 cubic yards of mixed refuse.
[2] Some employees engaged in refuse-disposal work reported with employees of another department.
[3] Not reported.
[4] Rubbish included with ashes.
[5] Employed only in the disposal of refuse.
[6] Includes employees of contractor, see note 5.
[7] No city employees other than inspectors of contract work, and they are reported under another department.
[8] Part of the expenses of refuse disposal is included with the expenses of street cleaning.
[9] Waste paper only. Other rubbish included with ashes.
[10] A total of 991 men employed from 6 to 11 days in disposing of refuse collected on "Clean city day."
[11] Expense of garbage removal only.
[12] Employees reported are engaged in the inspection of contract work, or the collection of dead animals, or the disposal of refuse, or all three.
[13] Includes city employees, see note 12.
[14] Ashes and rubbish included with garbage.
[15] Includes some rubbish.
[16] Expense of refuse-disposal inspection. Garbage removed free of cost to city by the contractor.

TABLE 12.—REFUSE DISPOSAL—QUANTITY OF GARBAGE, ASHES, AND RUBBISH COLLECTED, NUMBER OF EMPLOYEES ENGAGED IN SERVICE, AND EXPENSES OF COLLECTION AND DISPOSAL: 1909—Continued.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 39. Figures printed in italics are estimates.]

City number.	CITY.	QUANTITY COLLECTED DURING YEAR (CUBIC YARDS).							NUMBER OF EMPLOYEES.						EXPENSES OF COLLECTION AND DISPOSAL.		
		All refuse.				Garbage.	Ashes.	Rubbish.	Total.	City employees.	Contractors.	Per 10,000 inhabitants.	Per 10,000 cubic yards collected by—		Total.	Per 1,000 inhabitants.	Per 1,000 cubic yards collected.
		Total.	Collected by—		Per 1,000 inhabitants.												
			City employees.	Contractors.									City employees.	Contractors.			
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.																
48	Bridgeport, Conn.	15,625	....	15,625	157	15,625	....	....	31	[1] 2	29	3.1	....	[2] 19.6	$34,343	$345.85	$2,198.66
49	Spokane, Wash.	*49,755*	*49,755*	....	503	*27,280*	*15,500*	*6,975*	53	53	....	5.4	10.6	....	59,036	596.62	1,186.41
50	Hartford, Conn.	*118,075*	....	*118,075*	1,215	*34,375*	*65,100*	[3] *18,600*	77	[1] 2	75	7.9	....	[2] 6.5	34,785	357.80	294.59
51	Reading, Pa.	14,048	....	14,048	149	14,048	....	....	14	....	14	1.4	....	10.0	26,430	279.51	1,881.14
52	Trenton, N. J.	66,752	66,752	....	706	20,552	46,200	....	24	24	....	2.5	3.6	....	28,931	305.99	433.42
53	San Antonio, Tex.	13,104	13,104	....	141	13,104	....	....	54	54	....	5.8	41.2	....	27,689	298.44	2.113.66
54	New Bedford, Mass.	95,651	84,240	11,411	1,032	11,411	84,240	(4)	61	[5] 30	31	6.6	3.6	27.2	49,768	536.76	520.20
55	Camden, N. J.	*8,250*	*8,250*	....	89	....	*8,250*	(4)	17	17	....	1.8	20.7	....	[6] 1,006	(6)	(6)
56	Dallas, Tex.	*32,400*	*32,400*	....	370	....	....	*32,400*	14	14	....	1.6	4.3	....	10,125	115.57	312.50
57	Salt Lake City, Utah.	36,222	36,222	....	415	(7)	27,734	8,488	26	26	....	3.0	7.2	....	39,416	451.35	1,088.24
58	Lynn, Mass.	88,319	88,319	....	1,013	12,091	68,530	7,698	56	56	....	6.4	6.3	....	50,751	582.21	574.63
59	Wilmington, Del.	*61,288*	*52,000*	*9,288*	709	*9,288*	*52,000*	(4)	45	23	22	5.2	4.4	24.1	33,098	382.90	540.02
60	Springfield, Mass.	48,328	48,328	....	561	8,489	39,839	(4)	79	79	....	9.2	16.4	....	54,562	632.90	1,128.95
62	Lawrence, Mass.	62,577	62,577	....	753	5,467	47,630	9,480	76	76	....	9.1	12.1	....	60,469	727.67	966.27
64	Troy, N. Y.	141,465	141,465	....	1,844	141,465	(8)	(8)	53	53	....	6.9	3.7	....	53,892	702.45	380.97
65	Yonkers, N. Y.	*26,100*	*26,100*	....	341	*26,100*	(9)	(9)	60	60	....	7.8	23.0	....	60,355	....	....
67	Youngstown, Ohio.	7,702	....	7,702	101	7,702	....	....	9	[1] 5	4	1.2	....	[2] 11.7	20,812	272.98	2,702.86
68	Duluth, Minn.	[10] 600	600	....	8	450	....	150	18	[10] 18	....	2.4	(10)	....	[10] 6,312	(10)	(10)
69	Houston, Tex.	51,480	51,480	....	678	51,480	....	(11)	29	29	....	3.8	5.6	....	17,450	229.76	338.97
70	Somerville, Mass.	89,559	89,559	....	1,181	11,850	72,759	4,950	76	76	....	10.0	8.5	....	63,908	842.78	713.58
72	Utica, N. Y.	*93,466*	....	*93,466*	1,290	*17,971*	*75,495*	(4)	41	[1] 1	40	5.7	....	[2] 4.4	33,992	468.98	363.67
73	Waterbury, Conn.	13,904	....	13,904	195	13,904	....	....	21	....	21	3.0	....	15.1	21,442	301.19	1,542.59
74	Elizabeth, N. J.	*88,500*	....	*88,500*	1,244	*88,500*	(8)	(8)	20	....	20	2.8	....	2.3	11,825	166.22	133.62
76	Hoboken, N. J.	*41,400*	....	*41,400*	596	(7)	*37,800*	*3,600*	20	....	20	2.9	....	4.8	10,166	146.38	245.56
77	Manchester, N. H.	50,682	49,632	1,050	736	1,050	49,632	(4)	3	(12)	3	0.4	....	30.0	22,534	327.05	444.63
78	Evansville, Ind.	2,967	2,967	....	43	2,967	....	....	10	10	....	1.4	33.3	....	7,857	114.28	2,645.45
79	Birmingham, Ala.	56,160	56,160	....	819	56,160	(8)	(8)	58	58	....	8.5	10.3	....	38,890	566.91	692.49
81	Norfolk, Va.	131,705	131,705	....	1,981	14,054	18,391	99,260	42	[5] 42	....	6.3	3.2	....	26,959	405.46	204.70
83	Wilkes-Barre, Pa.	[13] 403	403	....	6	....	30	373	7	[13] 7	....	1.1	(13)	....	[13] 2,785	(13)	(13)
85	Savannah, Ga.	57,797	57,797	....	893	53,226	1,718	2,853	53	53	....	8.2	9.2	....	53,652	828.99	928.24
87	Harrisburg, Pa.	54,000	....	54,000	884	16,500	37,500	(4)	57	....	57	9.3	....	10.6	26,520	434.18	491.11
88	Fort Wayne, Ind.	8,656	....	8,656	14	8,656	....	....	10	[1] 4	6	1.6	....	[2] 11.5	10,375	170.31	1,198.04
89	Charleston, S. C.	42,442	42,442	....	725	42,442	(8)	(8)	27	27	....	4.6	6.4	....	18,644	318.37	439.30
90	Portland, Me.	*8,550*	*4,800*	*3,750*	148	*8,550*	....	....	16	12	4	2.8	25.0	10.5	[14] 10,198	176.37	1,192.75
91	Terre Haute, Ind.	*21,600*	....	*21,600*	377	*21,600*	....	....	15	[1] 9	6	2.6	....	[2] 6.9	9,886	172.47	457.69
92	East St. Louis, Ill.	5,760	5,760	....	102	5,760	....	....	24	24	....	4.2	41.4	....	[15] 6,374	112.46	1,106.60
93	Holyoke, Mass.	*44,406*	*41,600*	*2,806*	788	*2,806*	*41,000*	[3] *600*	37	[5] 31	6	6.6	7.5	21.4	26,664	472.93	600.41
94	Brockton, Mass.	189,080	189,080	....	3,420	5,400	183,680	(4)	32	32	....	5.8	1.7	....	31,862	576.37	168.51
96	Jacksonville, Fla.	86,874	86,874	....	1,620	78,282	1,332	7,260	45	45	....	8.4	5.2	....	51,859	967.34	596.97
97	Oklahoma City, Okla.	*29,284*	*29,284*	....	550	*3,968*	*516*	*24,800*	35	35	....	6.6	11.9	....	13,639	256.04	465.81
98	Bayonne, N. J.	24,466	24,466	....	460	5,928	18,538	(4)	24	[5] 24	....	4.5	9.8	....	13,907	261.61	568.33
99	Covington, Ky.	57,214	57,214	....	1,085	6,464	50,750	(4)	30	[5] 30	....	5.7	5.2	....	18,140	344.08	317.08
100	South Bend, Ind.	5,600	5,600	....	108	5,600	....	....	8	8	....	1.5	14.3	....	6,924	132.92	1,236.43
101	Passaic, N. J.	9,927	....	9,927	192	9,927	(8)	(8)	14	....	14	2.7	....	14.1	9,620	185.97	968.78
102	Mobile, Ala.	*8,220*	*8,220*	....	160	*8,220*	(8)	(8)	12	[5] 12	....	2.3	14.6	....	11,345	221.37	1,380.17
104	Allentown, Pa.	8,750	....	8,750	173	8,750	....	....	8	[1] 2	6	1.6	....	[2] 9.1	8,173	161.36	934.06
105	Pawtucket, R. I.	6,400	....	6,400	128	6,400	....	....	9	....	9	1.8	....	14.1	2,900	57.84	453.12

---

[1] Employees reported are engaged in the inspection of contract work, or the collection of dead animals, or the disposal of refuse, or all three.

[2] Includes city employees, see note 1.

[3] Waste paper only. Other rubbish included with ashes.

[4] Rubbish included with ashes.

[5] Some employees engaged in refuse-disposal work reported with employees of another department.

[6] Expense of disposal of ashes; all other expenses of refuse-disposal work included with street cleaning.

[7] Garbage included with ashes.

[8] Ashes and rubbish included with garbage.

[9] Not reported.

[10] City collected a small amount of refuse, with one wagon as an experiment, nearly all collections being private. City employed 10 inspectors, and collections were disposed of in its incinerator.

[11] Rubbish included with garbage.

[12] Reported with employees of another department.

[13] The refuse reported is that obtained from the annual cleaning of alleys. Employees include 3 men on the city dumps.

[14] Of this amount, $4,499 is the expense of the piggery, receipts from the operation of which amounted to $8,733.

[15] Part of the expenses of refuse disposal is included with the expenses of street cleaning.

TABLE 12.—REFUSE DISPOSAL—QUANTITY OF GARBAGE, ASHES, AND RUBBISH COLLECTED, NUMBER OF EMPLOYEES ENGAGED IN SERVICE, AND EXPENSES OF COLLECTION AND DISPOSAL: 1909—Continued.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 39. Figures printed in italics are estimates.]

City number.	CITY.	QUANTITY COLLECTED DURING YEAR (CUBIC YARDS).							NUMBER OF EMPLOYEES.						EXPENSES OF COLLECTION AND DISPOSAL.		
		All refuse.				Garbage.	Ashes.	Rubbish.	Total.	City employees.	Contractors.	Per 10,000 inhabitants.	Per 10,000 cubic yards collected by—		Total.	Per 1,000 inhabitants.	Per 1,000 cubic yards collected.
		Total.	Collected by—		Per 1,000 inhabitants.								City employees.	Contractors.			
			City employees.	Contractors.													
		GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.															
111	Lancaster, Pa.	7,200	...	7,200	154	7,200	...	...	9	...	9	1.9	...	12.5	$11,008	$235.62	$1,528.89
112	Sioux City, Iowa	*11,250*	...	11,250	241	*7,500*	3,750	(1)	13	[2] 4	9	2.8	...	[3] 11.6	9,912	212.29	881.07
114	Springfield, Ohio	*30,618*	*28,890*	*1,728*	685	*1,728*	*28,890*	...	14	8	6	3.1	2.8	35.3	13,700	306.56	447.42
115	Atlantic City, N. J	22,400	...	22,400	502	22,400	...	...	50	[2] 2	48	11.2	...	[3] 22.3	44,280	992.60	1,976.79
117	Rockford, Ill.	8,064	...	8,064	182	8,064	...	...	10	[2] 4	6	2.3	...	[3] 12.3	4,909	110.96	609.06
118	York, Pa.	*48,666*	...	*48,666*	1,114	*12,000*	*36,666*	(1)	20	...	20	4.6	...	4.1	18,600	425.63	382.17
120	Chattanooga, Tenn.	34,344	34,344	...	787	34,344	(4)	(4)	32	32	...	7.3	9.6	...	20,218	463.40	588.76
123	Malden, Mass.	39,280	39,280	...	908	3,302	35,978	(1)	32	32	...	7.4	8.1	...	25,709	594.02	654.51
124	Haverhill, Mass.	*39,179*	*30,000*	*9,179*	911	*9,179*	*30,000*	(1)	16	11	5	3.7	3.7	5.4	11,819	274.86	301.66
125	Pueblo, Colo.	*200*	[5] *200*	...	5	...	...	*200*	3	[5] 3	...	0.7	(5)	...	[5] 1,328	30.88	(5)
126	Salem, Mass.	*24,868*	*24,868*	...	569	*5,851*	*18,573*	*444*	21	21	...	4.9	8.6	...	16,381	384.26	674.95
127	New Britain, Conn.	5,616	...	5,616	132	5,616	...	...	4	...	4	0.9	...	7.2	2,108	49.58	375.09
128	Davenport, Iowa	*15,657*	*15,657*	...	368	*15,657*	...	...	15	15	...	3.5	9.6	...	12,167	286.28	776.95
130	Wheeling, W. Va.	*9,651*	...	*9,651*	233	*9,651*	...	...	12	[2] 6	6	2.9	...	[3] 12.4	13,381	323.21	1,386.63
131	Augusta, Ga.	22,476	22,476	...	550	22,476	(4)	(4)	20	20	...	4.9	8.9	...	14,968	365.97	665.84
133	Newton, Mass.	66,528	60,468	6,060	1,694	6,060	42,324	18,144	11	(6)	11	2.8	...	18.0	22,853	581.80	343.50
134	Dubuque, Iowa	*2,995*	...	*2,995*	77	*2,995*	...	...	13	[2] 4	9	3.3	...	[3] 43.3	3,087	79.03	1,029.00
135	Butte, Mont.	30,270	30,270	...	783	30,270	(4)	(4)	28	28	...	7.2	9.3	...	29,047	751.15	959.60
136	Chester, Pa.	*14,513*	...	*14,513*	381	*8,013*	*6,500*	(1)	9	...	9	2.4	...	6.5	7,900	207.19	544.45
138	Montgomery, Ala.	97,903	97,903	...	2,584	9,790	29,371	58,742	29	[7] 29	...	7.7	3.0	...	9,609	253.60	98.15
140	Galveston, Tex.	24,960	24,960	...	675	24,960	...	(8)	19	19	...	5.1	7.7	...	20,604	557.17	825.48
141	Fitchburg, Mass.	9,140	3,700	5,440	247	5,440	2,000	1,700	10	(6)	10	2.7	...	18.5	6,535	176.72	714.99
144	Quincy, Ill.	*6,576*	...	*6,576*	180	*6,576*	...	...	9	[2] 3	6	2.5	...	[3] 13.6	4,185	114.47	636.02
145	Knoxville, Tenn.	30,343	30,343	...	842	...	7,383	22,960	19	19	...	5.3	6.3	...	12,430	345.09	409.69
147	Macon, Ga.	*14,970*	*14,970*	...	422	*14,970*	(4)	(4)	42	42	...	11.8	28.0	...	10,214	250.16	682.30
148	Auburn, N. Y.	4,173	...	4,173	122	4,173	...	...	5	...	5	1.5	...	11.9	6,564	191.48	1,574.10
149	West Hoboken, N. J.	*39,000*	...	*39,000*	1,138	39,000	(4)	(4)	11	...	11	3.2	...	2.8	7,950	231.98	203.85
151	Taunton, Mass.	9,000	1,500	7,500	267	1,500	7,500	(1)	8	3	5	2.4	20.0	6.7	4,504	133.73	500.44
152	Everett, Mass.	19,957	15,075	4,882	610	4,882	15,075	(1)	18	[7] 10	8	5.5	6.6	16.3	9,074	277.41	454.61
154	Chelsea, Mass.	15,314	...	15,314	472	3,674	11,640	(1)	18	[2] 2	16	5.5	...	[3] 11.8	9,670	290.30	631.61
156	La Crosse, Wis.	1,620	1,620	...	54	[9] 1,620	...	...	3	3	...	1.0	18.7	...	1,574	52.15	971.60
157	Newport, Ky.	13,532	13,532	...	449	2,372	11,160	...	12	10	[10] 2	4.0	[11] 8.9	...	6,605	219.22	488.17

---

[1] Rubbish included with ashes.
[2] Employees reported are engaged in the inspection of contract work, or the collection of dead animals, or the disposal of refuse, or all three.
[3] Includes city employees; see note 2.
[4] Ashes and rubbish included with garbage.
[5] The refuse reported is that obtained from the "cleaning up" of alleys. Employees include 1 inspector of garbage collection (private).
[6] Reported with employees of another department.
[7] Some employees engaged on refuse-disposal work reported with employees of another department.
[8] Rubbish included with garbage.
[9] Collected in summer months only.
[10] Employed only in the disposal of refuse.
[11] Includes employees of contractor; see note 2.

Table 13.—STREET CLEANING—GENERAL.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see

City number.	CITY.	Total area (square yards) of paved streets and alleys.	PAVED STREETS AND ALLEYS REGULARLY CLEANED.												
								By hand sweeping.				By machine sweeping.			
			Area (square yards) subject to cleaning.	Per cent of total area of paved streets cleaned.	Amount (square yards) of cleaning done per week.	Average number of cleanings per week.	Quantity (cubic yards) of street sweepings removed.	Area (square yards) subject to cleaning.	Amount (square yards) of cleaning done per week.	Average number of cleanings per week.	Weeks in cleaning season.	Area (square yards) subject to cleaning.	Amount (square yards) of cleaning done per week.	Average number of cleanings per week.	Weeks in cleaning season.
	Grand total...	396,405,380	172,431,718	43.5	851,371,804	4.9	5,718,304	98,952,772	531,033,866	5.4	10–52	86,256,598	245,219,524	2.8	10–52
	Group I...........	187,167,555	97,395,707	49.5	474,224,619	4.8	3,820,361	56,194,892	313,304,227	5.6	28–52	43,466,405	128,731,148	3.0	23–52
	Group II..........	98,067,718	34,050,793	36.8	179,424,992	5.0	850,796	18,394,728	97,141,367	5.3	17–52	19,377,950	54,880,552	2.8	25–52
	Group III.........	67,863,355	28,606,718	42.7	143,763,477	5.0	640,303	17,903,037	87,687,915	4.9	10–52	16,509 518	44,779,648	2.7	10–52
	Group IV..........	43,306,752	12,378,500	28.6	53,958,716	4.4	406,844	6,460,115	32,900,357	5.1	20–52	6,902,725	16,828,176	2.4	20–52
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.														
1	New York, N. Y....	38,204,111	[3] 30,203,317	79.1	197,508,892	6.5	816,362	30,115,905	193,996,104	6.2	40–52	1,319,034	3,512,788	2.7	28–32
2	Chicago, Ill.........	25,607,750	(6)	(6)	(6)	(6)	815,703	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)
3	Philadelphia, Pa....	19,845,596	16,698,182	84.1	107,220,317	6.4	259,754	7,031,225	42,187,350	6.0	52	16,698,182	65,032,967	3.9	52
4	St. Louis, Mo........	14,321,965	6,050,204	42.2	21,275,639	3.5	332,062	3,676,864	14,667,159	4.0	50	2,373,340	2,373,340	1.0	50
5	Boston, Mass........	9,705,156	[3] 3,312,536	34.1	[7] 7,838,430	2.4	70,844	481,536	(6)	(6)	(6)	2,831,000	7,451,000	2.6	46
6	Baltimore, Md.......	7,893,953	(6)	(6)	(6)	(6)	433,193	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)
7	Cleveland, Ohio....	7,743,917	7,403,373	95.6	14,905,838	2.0	163,431	750,740	4,534,180	6.0	40	....	....	....	....
8	Pittsburgh, Pa......	7,610,003	6,259,500	82.3	23,202,000	3.7	146,649	1,650,000	8,100,000	4.9	40	4,680,000	14,550,000	3.1	40
9	Detroit, Mich........	7,435,743	6,584,377	88.6	8,968,119	1.4	112,554	1,138,668	2,277,336	2.0	32	3,264,009	3,264,009	1.0	32
10	Buffalo, N. Y........	7,473,548	[3] 7,184,563	96.1	21,265,094	3.0	(6)	1,191,546	7,149,276	6.0	39	6,926,350	14,115,818	2.0	39
11	San Francisco, Cal..	7,442,903	2,284,801	32.9	6,666,302	2.7	121,087	2,261,001	6,020,338	2.7	52	184,719	645,964	3.5	52
12	Cincinnati, Ohio....	8,745,068	2,683,461	30.7	22,395,276	8.3	129,359	1,430,422	7,358,808	5.1	46	1,253,089	7,518,234	6.0	29
13	Milwaukee, Wis....	8,719,979	1,374,279.	15.8	10,492,564	7.6	10,100	1,025,657	6,153,942	6.0	28	348,622	348,622	1.0	28
14	Newark, N. J........	3,829,505	3,347,397	87.4	10,398,703	3.1	101,295	3,010,432	8,102,698	2.7	46	1,349,655	1,349,655	1.0	40
15	New Orleans, La...	4,719,262	420,420	8.9	4,103,312	9.8	186,684	420,420	1,481,740	3.5	52	330,905	1,859,914	5.6	52
16	Washington, D. C..	7,869,076	3,589,297	45.6	17,984,133	5.0	121,284	2,010,476	11,275,296	5.6	44–46	1,907,550	6,708,837	3.5	23–44
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.														
17	Minneapolis, Minn..	2,213,066	1,575,623	71.2	6,683,745	4.2	16,000	163,073	978,438	6.0	32	1,575,623	4,726,869	3.0	32
18	Los Angeles, Cal....	12,565,572	[3] 2,547,116	20.3	14,066,706	5.5	26,790	1,173,334	6,570,670	5.6	52	855,738	4,046,435	4.7	52
19	Jersey City, N. J....	2,423,156	(6)	(6)	(6)	(6)	84,043	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)
20	Kansas City, Mo....	5,874,925	3,509,349	59.7	16,256,021	4.6	16,714	3,382,049	12,328,154	3.6	40–45	687,300	687,300	1.0	40
21	Indianapolis, Ind...	4,459,238	3,375,072	69.4	21,482,432	6.4	58,824	3,375,072	20,250,432	6.0	38	3,375,072	(6)	(6)	38
22	Louisville, Ky......	4,695,101	2,618,100	55.8	6,971,800	2.7	91,126	352,500	1,585,000	4.5	50	440,000	1,550,000	3.5	33
23	Seattle, Wash......	2,954,233	429,090	14.5	2,339,570	5.5	25,288	22,180	133,080	6.0	52	134,410	571,490	4.3	52
24	Providence, R. I....	4,340,818	802,417	18.5	2,427,979	3.0	38,790	270,927	1,625,562	6.0	50	802,417	802,417	1.0	33
25	Rochester, N. Y....	3,186,009	2,026,325	63.6	12,984,023	6.4	23,513	2,026,325	10,192,072	5.0	34	880,479	1,924,018	2.2	28
26	St. Paul, Minn.....	2,341,644	991,311	42.3	6,773,960	6.8	23,100	991,311	5,947,866	6.0	29	....	....	....	....
27	Denver, Colo.......	3,022,154	[3] 980,000	32.4	7,980,000	8.1	33,368	160,000	1,120,000	7.0	52	740,000	5,180,000	7.0	52
28	Portland, Oreg.....	4,162,324	1,137,900	27.3	5,524,950	4.9	20,652	4,000	28,000	7.0	52	1,133,900	5,496,950	4.8	52
29	Columbus, Ohio....	3,697,214	3,324,720	89.9	6,360,861	1.9	66,945	320,508	1,923,048	6.0	45	2,510,767	3,486,635	1.4	40
30	Toledo, Ohio.......	3,217,804	620,283	19.3	4,673,781	7.5	36,990	620,283	4,341,981	7.0	34	....	....	....	....
31	Worcester, Mass....	3,304,071	[3] 505,002	15.3	1,739,568	3.4	30,051	182,391	1,094,346	6.0	41	322,611	645,222	2.0	41
32	Atlanta, Ga........	2,535,682	1,447,415	57.1	12,083,330	8.3	21,090	278,775	1,951,425	7.0	52	1,168,640	8,180,480	7.0	52
33	Syracuse, N. Y.....	1,374,160	1,257,656	91.5	15,391,292	12.2	15,772	1,257,656	8,803,592	7.0	32	416,603	2,916,221	7.0	32
34	New Haven, Conn..	1,532,523	361,293	23.6	3,612,930	10.0	(6)	361,293	2,167,758	6.0	40	361,293	1,445,172	4.0	40
35	Scranton, Pa.......	595,217	531,468	89.3	5,612,626	10.6	4,820	313,935	1,328,154	4.2	26	531,468	2,393,754	4.5	26
36	Paterson, N. J......	1,884,296	421,962	22.4	1,494,434	3.5	24,000	298,888	1,230,704	4.1	40	263,780	263,730	1.0	40
37	Omaha, Nebr.......	2,609,958	146,000	5.6	581,000	4.0	39,928	46,000	276,000	6.0	52	100,000	200,000	2.0	25
38	Fall River, Mass....	1,508,726	225,000	14.9	1,350,000	6.0	7,200	225,000	1,350,000	6.0	40	....	....	....	....
39	Memphis, Tenn.....	3,539,803	560,064	15.8	3,264,800	5.8	33,750	162,624	663,168	4.1	52	366,432	1,958,592	5.3	50
40	Richmond, Va......	2,616,832	1,047,187	40.0	2,766,287	2.6	23,250	151,200	302,400	2.0	52	993,987	2,463,887	2.5	52
41	Oakland, Cal.......	4,749,762	[3] 668,810	14.1	4,124,860	6.2	15,372	117,330	703,980	6.0	52	551,480	3,308,880	6.0	52
42	Grand Rapids, Mich	3,561,296	793,500	22.3	1,801,500	2.3	16,848	168,000	1,008,000	6.0	30	793,500	793,500	1.0	30
43	Nashville, Tenn....	3,515,423	[3] 406,342	11.6	3,478,052	8.6	34,362	307,486	1,718,252	5.6	43–50	293,300	1,759,800	6.0	42
44	Lowell, Mass.......	2,404,780	285,120	11.9	1,314,720	4.6	7,560	205,920	1,235,520	6.0	35	79,200	79,200	1.0	30
45	Cambridge, Mass...	1,652,796	199,609	12.1	1,197,654	6.0	(6)	199,609	1,197,654	6.0	52	....	....	....	....
46	Dayton, Ohio.......	1,529,135	1,257,059	82.2	5,086,111	4.0	14,650	1,257,059	5,086.111	4.0	17–32	....	....	....	....

[1] The area both hand and machine swept is included under each heading in the preceding columns.
[2] The area both swept and flushed is included under both sweeping and flushing in the preceding columns.
[3] Includes area of some streets with oil or water bound surface.
[4] The employees engaged on street cleaning in the boroughs of Bronx, Brooklyn, and Manhattan are reported with employees of another department.

STATISTICS OF STREET CLEANING: 1909.

page 85. For a text discussion of this table, see page 57. Figures printed in italics are estimates.]

PAVED STREETS AND ALLEYS REGULARLY CLEANED—contd.						STREETS AND ALLEYS OCCASIONALLY CLEANED.						ALL STREETS AND ALLEYS.				
By flushing.				Area (square yards) subject to both hand and machine sweeping.[1]	Area (square yards) subject to both sweeping and flushing.[2]	Length (miles) of classes subject to cleaning.					Quantity (cubic yards) of street sweepings removed.	Persons employed in street cleaning.	Quantity (cubic yards) of street sweepings removed.	Payments for expenses of street cleaning.		City number.
Area (square yards) subject to cleaning.	Amount (square yards) of cleaning done per week.	Average number of cleanings per week.	Weeks in cleaning season.			Total.	Durably paved.	Macadam.	Gravel.	All other.				Total.	Per 1,000 inhabitants.	
33,372,653	75,118,414	2.3	6-52	29,125,929	17,024,376	14,163.6	1,729.8	4,690.4	2,231.8	5,502.6	612,160	22,560	6,330,464	$18,503,413	$447.81	
17,985,758	32,189,244	1.8	16-52	12,457,172	7,794,176	3,213.0	491.2	2,264.0	5.5	452.3	311,474	13,963	4,131,835	13,857,640	527.29	
9,212,858	27,408,073	3.0	6-52	7,624,193	5,310,550	5,835.7	457.4	888.7	1,216.2	3,273.4	187,054	4,052	1,037,850	2,390,145	448.84	
4,010,558	11,295,914	2.8	15-52	6,918,477	2,897,918	2,971.5	518.6	753.9	634.9	1,064.1	53,854	3,072	694,157	1,675,217	404.58	
2,163,479	4,230,183	2.0	12-52	2,126,087	1,021,732	2,143.4	262.6	792.8	375.2	712.8	59,778	1,473	466,622	580,411	280.11	

GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.

...	...	...	...	1,231,622	...	609.0	...	593.0	...	16.0	37,609	[4] 4,782	853,971	[5] $7,681,274	$1,657.97	1
(6)	(6)	(6)	(6)	...	...	583.2	...	571.1	...	12.1	(6)	1,153	815,703	908,472	424.09	2
...	...	...	...	7,031,225	...	...	...	...	...	...	...	2,755	259,754	[5] 1,255,525	822.55	3
3,478,930	4,285,140	1.2	50	...	3,478,930	417.0	141.0	276.0	...	...	84,266	1,275	416,328	[5] 819,970	1,210.96	4
387,430	387,430	1.0	30	...	387,430	374.0	...	374.0	...	...	50,991	529	121,835	460,455	700.51	5
(6)	(6)	(6)	(6)	...	...	(6)	(6)	(6)	(6)	(6)	(6)	437	433,193	359,606	648.99	6
7,403,373	10,371,658	1.4	30	...	750,740	113.4	113.4	...	...	...	(6)	329	163,431	194,879	361.98	7
379,500	552,000	1.5	40	450,000	...	75.0	75.0	...	...	...	(6)	611	146,649	[5] 426,012	807.31	8
3,320,368	3,426,774	1.0	32	1,138,668	...	(6)	(6)	...	...	...	(6)	386	112,554	174,194	389.28	9
...	...	...	...	933,333	...	25.0	25.0	...	...	...	(6)	241	(6)	211,237	508.62	10
...	...	...	...		160,919	250.9	2.9	8.0	...	240.0	59,000	175	180,087	255,371	622.34	11
1,253,039	7,518,284	6.0	29	...	1,253,039	211.0	110.5	95.0	5.5	...	6,972	366	136,331	[5] 236,386	655.81	12
665,000	3,990,000	6.0	28	...	665,000	457.3	...	273.1	...	184.2	27,000	(8)	37,100	168,824	470.18	13
946,350	946,350	1.0	16	1,012,690	946,350	28.0	3.0	25.0	...	...	22,042	332	123,337	271,916	809.39	14
151,768	761,658	5.0	52	330,905	151,768	...	...	...	...	...	...	194	186,684	138,208	413.21	15
...	...	...	...	328,729	...	69.2	20.4	48.8	...	...	23,594	398	144,878	295,311	904.67	16

GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.

163,073	978,438	6.0	32	163,073	163,073	462.0	...	16.0	...	446.0	(6)	321	16,000	$100,435	$341.23	17
1,220,267	3,449,601	2.8	52	391.111	311,112	202.8	2.8	...	...	200.0	48,000	206	74,790	91,416	314.28	18
...	...	...	...	...	...	76.0	...	...	...	76.0	(6)	(8)	84,043	141,764	542.16	19
1,610,322	3,240,567	2.0	31	560.000	1,610.322	91.0	76.0	15.0	...	...	(6)	321	16,714	[9] 212,798	880.17	20
176,000	1,232,000	7.0	35	3,375,072	176,000	41.5	...	10.0	31.5	...	(6)	223	58,824	115,712	505.98	21
1,865,600	3,836,800	2.1	35	25,000	15,000	101.0	38.0	60.0	...	3.0	(6)	282	91,126	113,224	509.35	22
272,500	1,635,000	6.0	52	...	...	448.0	...	...	...	448.0	9,206	168	34,494	119,992	541.75	23
...	...	...	...	270,927	...	200.7	...	196.2	4.5	...	43,470	167	82,260	81,145	369.31	24
289,311	867,933	3.0	20-34	880,479	289,311	222.4	28.6	(6)	40.8	153.0	9,432	313	[10] 32,945	147,926	698.88	25
495,656	826,094	1.7	29	...	495,656	752.6	8.0	48.1	15.2	681.3	2,600	170	25,700	69,448	328.27	26
240,000	1,680,000	7.0	26	160,000	...	1,021.3	...	...	93.9	927.4	17,514	98	50,882	120,816	583.34	27
...	...	...	...	...	...	181.0	...	(6)	181.0	...	31,300	127	51,952	129,116	679.49	28
777,000	951,178	1.2	45	...	283,555	28.5	20.4	8.1	...	...	360	100	67,305	[11] 97,477	579.01	29
110,600	331,800	3.0	30	...	110,600	441.0	232.0	...	...	209.0	(6)	107	36,990	49,613	300.23	30
...	...	...	...	...	...	185.9	...	...	185.9	...	(6)	56	30,051	58,021	406.20	31
278,775	1,951,425	7.0	52	...	278,775	50.0	...	50.0	...	...	(6)	63	21,000	45,369	333.79	32
524,497	3,671,479	7.0	32	416.603	524,497	...	...	...	...	...	...	265	15,772	97,004	725.87	33
...	...	...	...	361.293	...	66.0	...	66.0	...	...	(6)	87	(6)	58,993	449.16	34
595,217	1,890,718	3.2	26	313.935	595,217	119.0	...	...	119.0	(6)	(6)	138	4,820	27,602	216.47	35
...	...	...	...	140,656	...	69.0	...	69.0	...	...	2,000	36	26,000	28,093	228.25	36
35,000	105,000	3.0	25	...	35,000	285.0	...	...	285.0	...	(6)	60	39,928	47,787	391.09	37
...	...	...	...	...	...	95.3	15.0	40.0	40.3	...	1,240	62	8,440	43,424	371.43	38
506,040	643,040	1.3	50	105,600	366,432	...	...	...	...	...	...	85	33,750	50,086	429.15	39
...	...	...	...	98,000	...	117.7	16.5	...	71.2	30.0	(6)	60	23,250	49,515	426.67	40
56,000	112,000	2.0	6	...	56,000	244.7	...	198.0	...	46.7	9,500	130	24,872	74,585	645.98	41
...	...	...	...	[7] 168,000	...	158.5	3.2	7.4	147.9	...	11,232	90	28,080	30,404	276.25	42
...	...	...	...	194,444	...	20.0	...	20.0	...	...	(6)	48	34,362	53,406	487.19	43
...	...	...	...	...	...	...	...	...	...	...	...	83	7,560	43,581	418.44	44
...	...	...	...	...	...	101.8	16.9	84.9	...	...	(6)	80	(6)	36,937	356.78	45
...	...	...	...	...	...	53.0	...	...	...	53.0	1,200	106	15,850	54.456	542.77	46

[5] Includes part of expense of refuse disposal.
[6] Not reported.
[7] Exclusive of streets swept by hand.
[8] Reported with employees of another department.
[9] Includes the expense of sewer maintenance.
[10] Exclusive of sweepings removed from 1,019,977 square yards, area swept by contractor.
[11] Includes the expense of street sprinkling.

Table 13.—STREET CLEANING—GENERAL

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see

City number.	CITY.	Total area (square yards) of paved streets and alleys.	PAVED STREETS AND ALLEYS REGULARLY CLEANED.												
								By hand sweeping.				By machine sweeping.			
			Area (square yards) subject to cleaning.	Per cent of total area of paved streets cleaned.	Amount (square yards) of cleaning done per week.	Average number of cleanings per week.	Quantity (cubic yards) of street sweepings removed.	Area (square yards) subject to cleaning.	Amount (square yards) of cleaning done per week.	Average number of cleanings per week.	Weeks in cleaning season.	Area (square yards) subject to cleaning.	Amount (square yards) of cleaning done per week.	Average number of cleanings per week.	Weeks in cleaning season.
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.														
47	Albany, N. Y.	1,585,908	1,313,545	82.8	4,844,090	3.7	(3)	300,000	2,100,000	7.0	52	1,313,545	2,627,090	2.0	33
48	Bridgeport, Conn.	1,448,638	169,118	11.7	903,840	5.3	6,000	141,401	848,406	6.0	40	27,717	55,434	2.0	40
49	Spokane, Wash.	421,358	[1] 414,000	98.3	3,927,600	9.5	11,025	160,400	962,400	6.0	45	414,000	2,484,000	6.0	40
50	Hartford, Conn.	1,904,270	224,000	11.8	2,658,000	11.9	21,600	224,000	1,568,000	7.0	40	85,000	545,000	6.4	40
51	Reading, Pa.	2,073,461	435,000	21.0	1,885,000	4.3	3,650	290,000	1,740,000	6.0	52	....	....	....	....
52	Trenton, N. J.	710,264	549,927	77.4	3,299,562	6.0	(3)	549,927	3,299,562	6.0	39	....	....	....	....
53	San Antonio, Tex.	3,338,250	203,730	6.1	2,444,760	12.0	9,828	203,730	1,222,380	6.0	52	203,730	1,222,380	6.0	52
54	New Bedford, Mass.	1,256,447	170,968	13.6	1,412,978	8.3	(3)	170,968	1,196,776	7.0	52	85,484	170,968	2.0	12
55	Camden, N. J.	1,046,349	413,892	39.6	2,513,892	6.1	(3)	350,000	2,100,000	6.0	35	413,892	413,892	1.0	35
56	Dallas, Tex.	1,310,399	344,100	26.3	4,054,200	11.8	16,800	344,100	2,064,600	6.0	52	216,900	1,301,400	6.0	52
57	Salt Lake City, Utah	848,791	764,920	90.1	3,633,840	4.8	8,000	260,500	1,563,000	6.0	49	504,420	1,008,840	2.0	20
58	Lynn, Mass.	576,077	[1] 191,582	33.3	1,915,820	10.0	6,360	191,582	1,341,074	7.0	52	191,582	574,746	3.0	52
59	Wilmington, Del.	1,094,050	525,000	48.0	1,815,000	3.5	(3)	525,000	1,210,000	2.3	40	525,000	525,000	1.0	40
60	Springfield, Mass.	2,843,113	186,172	6.5	1,868,982	10.0	(3)	177,471	1,242,297	7.0	36	173,604	522,840	3.0	36
61	Des Moines, Iowa	1,510,118	181,056	12.0	1,269,958	7.0	31,916	123,050	246,100	2.0	34	58,006	348,036	6.0	34
62	Lawrence, Mass.	635,513	122,886	19.3	677,316	5.5	2,160	97,155	554,430	5.7	10–40	122,886	122,886	1.0	10–36
63	St. Joseph, Mo.	1,458,319	460,800	31.6	3,916,800	8.5	4,992	460,800	2,764,800	6.0	50	....	....	....	....
64	Troy, N. Y.	887,150	800,000	90.2	6,880,000	8.6	(3)	800,000	4,800,000	6.0	40	400,000	1,200,000	3.0	40
65	Yonkers, N. Y.	1,499,148	[1] 1,499,148	100.0	4,363,874	2.9	45,000	1,499,148	4,034,036	2.7	52	54,973	329,838	6.0	26
66	Tacoma, Wash.	1,140,508	479,369	42.0	2,812,694	5.9	12,480	290,319	1,741,914	6.0	52	157,290	943,740	6.0	52
67	Youngstown, Ohio	827,212	794,000	96.0	1,630,280	2.1	15,549	108,120	648,720	6.0	32	....	....	....	....
68	Duluth, Minn.	2,815,533	165,640	5.9	1,284,500	7.8	7,548	165,640	993,840	6.0	37	115,856	152,786	1.3	37
69	Houston, Tex.	1,266,240	505,068	39.9	4,519,272	8.9	35,100	505,068	1,724,136	3.4	52	505,068	1,724,136	3.4	52
70	Somerville, Mass.	1,050,925	[1] 1,050,925	100.0	1,175,925	1.1	16,248	25,000	150,000	6.0	52	1,025,925	1,025,925	1.0	30
71	Kansas City, Kans.	1,432,627	511,492	35.7	1,283,432	2.5	1,560	511,492	1,283,432	2.5	40–45	....	....	....	....
72	Utica, N. Y.	1,194,175	1,121,592	93.9	11,200,608	10.0	20,160	1,121,592	6,729,552	6.0	35	1,121,592	4,471,056	4.0	28
73	Waterbury, Conn.	316,055	193,205	61.1	1,159,230	6.0	14,000	193,205	1,159,230	6.0	40	....	....	....	....
74	Elizabeth, N. J.	947,578	[1] 793,745	83.8	5,355,740	6.7	(3)	793,745	3,850,100	4.9	32	250,940	1,505,640	6.0	32
75	Schenectady, N. Y.	895,923	778,730	86.9	6,300,233	8.1	10,000	506,878	3,041,268	6.0	35	772,016	2,958,785	3.8	35
76	Hoboken, N. J.	404,885	[1] 404,885	100.0	1,717,304	4.2	9,600	293,905	587,810	2.0	40	188,249	1,129,494	6.0	40
77	Manchester, N. H.	620,532	[1] 184,773	29.8	933,981	5.1	1,314	112,273	673,638	6.0	40	184,773	184,773	1.0	33
78	Evansville, Ind.	1,039,330	840,978	80.9	2,405,900	2.9	2,000	152,560	915,360	6.0	52	840,978	1,490,540	1.8	40
79	Birmingham, Ala.	1,986,734	508,334	25.6	1,549,468	3.0	7,488	....	....	....	....	508,334	1,549,468	3.0	52
80	Akron, Ohio	1,007,156	500,000	49.6	1,850,000	3.7	84,000	250,000	1,500,000	6.0	30	....	....	....	....
81	Norfolk, Va.	1,062,337	715,617	67.4	2,771,093	3.9	26,536	276,648	1,478,472	5.3	52	460,246	1,292,621	2.8	52
82	Fort Worth, Tex.	1,478,103	155,287	10.5	3,004,804	19.4	9,360	155,287	986,073	6.4	52	155,287	931,722	6.0	52
83	Wilkes-Barre, Pa.	456,483	435,666	95.4	1,731,310	4.0	9,600	82,578	465,576	5.6	40	435,666	1,265,734	2.9	40
84	Erie, Pa.	896,455	896,455	100.0	1,218,755	1.4	13,620	896,455	1,218,755	1.4	35	....	....	....	....
85	Savannah, Ga.	868,006	779,167	89.8	3,637,724	4.7	28,142	140,814	844,884	6.0	52	638,353	2,792,840	4.4	52
86	Peoria, Ill.	1,617,617	1,071,776	70.4	3,563,993	3.1	32,500	497,554	2,415,549	4.9	36	574,222	1,148,444	2.0	28
87	Harrisburg, Pa.	949,997	762,000	80.2	4,572,000	6.0	(3)	762,000	4,572,000	6.0	44	....	....	....	....
88	Fort Wayne, Ind.	877,720	847,640	96.6	3,664,525	4.3	(3)	512,161	3,072,966	6.0	40	335,479	335,479	1.0	40
89	Charleston, S. C.	602,384	[1] 493,368	81.9	1,565,351	3.2	8,271	82,433	494,598	6.0	52	410,935	1,070,753	2.6	52
90	Portland, Me.	2,252,000	320,272	14.2	854,058	2.7	4,800	320,272	854,058	2.7	30	....	....	....	....
91	Terre Haute, Ind.	1,784,416	505,350	28.3	2,274,075	4.5	19,110	505,350	2,274,075	4.5	52	....	....	....	....
92	East St. Louis, Ill.	1,017,350	75,084	7.4	450,504	6.0	(3)	75,084	450,504	6.0	52	....	....	....	....
93	Holyoke, Mass.	846,312	[1] 280,296	33.1	1,575,126	5.6	4,620	202,648	1,215,888	6.0	35	213,148	359,238	1.7	35
94	Brockton, Mass.	487,923	164,266	33.7	164,266	1.0	485	....	....	....	....	164,266	164,266	1.0	28
95	Johnstown, Pa.	444,860	280,000	62.9	1,960,000	7.0	(3)	280,000	1,680,000	6.0	35	280,000	280,000	1.0	35
96	Jacksonville, Fla.	1,129,099	422,815	37.4	2,106,012	5.0	19,296	18,790	112,740	6.0	52	422,815	1,993,272	4.7	52
97	Oklahoma City, Okla.	1,666,510	101,575	6.1	812,600	8.0	22,464	....	....	....	....	101,575	406,300	4.0	52
98	Bayonne, N. J.	526,520	[1] 242,020	46.0	1,936,160	8.0	7,086	242,020	1,452,120	6.0	35	242,020	484,040	2.0	35
99	Covington, Ky.	992,240	312,176	31.5	1,245,668	4.0	5,600	312,176	933,492	3.0	39	312,176	312,176	1.0	39
100	South Bend, Ind.	1,125,584	[1] 1,081,850	96.1	1,785,850	1.7	15,960	140,800	844,800	6.0	40	941,050	941,050	1.0	40
101	Passaic, N. J.	553,730	54,770	9.9	328,620	6.0	(3)	54,770	328,620	6.0	36	....	....	....	....
102	Altoona, Pa.	427,520	387,520	90.6	575,020	1.5	4,050	27,000	162,000	6.0	30	360,520	413,020	1.1	30
103	Mobile, Ala.	411,940	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
104	Allentown, Pa.	450,957	264,000	58.5	2,112,000	8.0	4,000	264,000	1,584,000	6.0	35	....	....	....	....
105	Pawtucket, R. I.	1,544,247	155,168	10.6	389,884	2.5	425	155,168	389,884	2.5	40	....	....	....	....

---

[1] The area both hand and machine swept is included under each heading in the preceding columns.

[2] The area both swept and flushed is included under both sweeping and flushing in the preceding columns.

[3] Not reported.

STATISTICS OF STREET CLEANING: 1909—Continued.

page 85. For a text discussion of this table, see page 57. Figures printed in italics are estimates.]

PAVED STREETS AND ALLEYS REGULARLY CLEANED—contd.						STREETS AND ALLEYS OCCASIONALLY CLEANED.						ALL STREETS AND ALLEYS.				
By flushing.				Area (square yards) subject to both hand and machine sweeping.[1]	Area (square yards) subject to both sweeping and flushing.[2]	Length (miles) of classes subject to cleaning.					Quantity (cubic yards) of street sweepings removed.	Persons employed in street cleaning.	Quantity (cubic yards) of street sweepings removed.	Payments for expenses of street cleaning.		City number.
Area (square yards) subject to cleaning.	Amount (square yards) of cleaning done per week.	Average number of cleanings per week.	Weeks in cleaning season.			Total.	Durably paved.	Macadam.	Gravel.	All other.				Total.	Per 1,000 inhabitants.	
GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.																
39,000	117,000	3.0	33	300,000	39,000	15.2	8.8	6.4	......	......	(3)	98	(3)	58,227	583.38	47
......	......	......	......	......	......	72.7	......	72.7	......	......	(3)	[4] 81	6,000	47,000	473.31	48
160,400	481,200	3.0	22	160,400	160,400	281.0	......	......	......	281.0	(3)	[4] 56	11,025	44,674	451.48	49
85,000	545,000	6.4	40	85,000	85,000	105.0	......	95.0	......	10.0	(3)	[4] 95	21,600	46,669	480.03	50
145,000	145,000	1.0	32	......	......	110.8	......	51.8	59.0	......	(3)	24	3,650	17,810	188.35	51
......	......	......	......	......	......	94.4	......	11.4	......	83.0	(3)	[4] 88	(3)	33,072	349.78	52
......	......	......	......	203,730	......	(3)	(3)	(3)	(3)	(3)	(3)	52	9,828	24,251	261.38	53
45,234	45,234	1.0	20	85,484	45,234	82.9	7.9	75.0	......	......	(3)	[4] 54	(3)	29,326	316.29	54
......	......	......	......	350,000	......	41.0	37.0	4.0	......	......	(3)	[4] 43	(3)	[6] 32,506	351.30	55
344,100	688,200	2.0	52	216,900	344,100	47.6	......	47.6	......	......	(3)	49	16,800	27,590	314.92	56
177,000	1,062,000	6.0	30	......	177,000	351.0	......	......	......	351.0	(3)	[4] 73	8,000	48,070	550.44	57
......	......	......	......	191,582	......	110.0	......	......	110.0	......	4,148	20	10,508	17,054	195.64	58
80,000	80,000	1.0	32	525,000	80,000	20.0	......	20.0	......	......	(3)	[4] 57	(3)	23,484	271.68	59
34,615	103,845	3.0	36	164,903	34,615	146.6	......	65.9	80.7	......	(3)	60	(3)	50,892	590.33	60
96,546	675,822	7.0	34	......	96,546	36.0	36.0	......	......	......	(3)	52	31,916	28,582	337.89	61
......	......	......	......	97,155	......	107.0	......	26.0	81.0	(3)	2,640	[4] 27	4,800	14,500	174.49	62
345,600	1,152,000	3.8	40	......	345,600	50.0	25.0	25.0	......	......	(3)	[4] 40	4,992	39,100	505.17	63
315,000	880,000	2.8	28	400,000	315,000	2.5	......	2.5	......	......	(3)	[4] 231	(3)	73,672	960.27	64
......	......	......	......	54,973	......	......	......	......	......	......	......	[4] 71	45,000	56,305	736.01	65
31,760	127,040	4.0	30	......	(3)	151.5	......	......	......	151.5	(3)	[4] 41	12,480	16,881	221.16	66
685,880	981,560	1.4	32	......	......	10.0	10.0	......	......	......	(3)	49	15,549	25,657	336.53	67
94,381	137,874	1.5	28	115,856	94,381	7.0	7.0	(3)	(3)	(3)	(3)	[4] 27	7,548	19,589	257.61	68
178,500	1,071,000	6.0	52	505,068	178,500	46.6	......	2.1	44.5	......	9,360	87	44,460	18,841	248.07	69
......	......	......	......	......	......	21.2	......	......	21.2	......	(3)	[4] 40	16,248	18,810	248.05	70
......	......	......	......	......	......	18.0	16.0	2.0	......	......	(3)	38	1,560	25,081	335.31	71
......	......	......	......	1,121,592	......	(3)	(3)	(3)	(3)	(3)	(3)	[4] 102	20,160	63,439	875.26	72
......	......	......	......	......	......	57.0	......	7.0	......	50.0	(3)	[4] 50	14,000	22,000	309.03	73
......	......	......	......	250,940	......	67.0	......	19.0	......	48.0	(3)	[4] 68	(3)	44,139	620.45	74
50,030	300,180	6.0	15	500,164	50,030	(3)	......	......	......	(3)	(3)	[4] 100	10,000	57,578	820.20	75
......	......	......	......	77,269	......	......	......	......	......	......	......	46	9,600	20,118	289.68	76
75,570	75,570	1.0	22	112,273	75,570	82.0	82.0	(3)	......	(3)	12,480	(7)	13,794	7,157	103.88	77
......	......	......	......	152,560	......	9.2	......	5.2	4.0	......	1,292	20	3,292	12,609	183.40	78
......	......	......	......	......	......	67.0	2.0	65.0	......	......	1,728	55	9,216	13,577	197.92	79
250,000	350,000	1.4	30	......	......	40.0	40.0	......	......	......	(3)	[4] 20	84,000	24,277	363.81	80
......	......	......	......	21,277	......	12.0	......	......	......	12.0	(3)	[4] 78	26,536	59,143	889.50	81
155,287	1,067,009	7.0	52	155,287	155,287	......	......	......	......	......	......	[4] 70	9,360	19,505	293.66	82
......	......	......	......	82,578	......	(3)	......	......	......	(3)	(3)	[4] 49	9,600	18,790	285.82	83
......	......	......	......	......	......	......	......	......	......	......	......	[4] 52	13,620	10,896	166.86	84
......	......	......	......	......	......	4.8	......	1.0	1.4	2.4	(3)	52	28,142	32,901	508.36	85
......	......	......	......	......	......	......	......	......	......	......	......	[4] 41	32,500	23,948	385.64	86
......	......	......	......	......	......	10.0	......	10.0	......	......	(3)	[4] 134	(3)	48,000	785.85	87
256,080	256,080	1.0	40	......	256,080	3.3	3.3	......	......	......	(3)	[4] 38	(3)	16,837	276.38	88
......	......	......	......	......	......	7.0	......	......	5.0	2.0	(3)	40	8,271	20,634	352.36	89
......	......	......	......	......	......	95.0	95.0	(3)	(3)	......	7,200	82	12,000	34,729	600.64	90
......	......	......	......	......	......	58.0	......	2.5	55.5	......	10,920	37	30,030	28,694	500.59	91
......	......	......	......	......	......	41.0	41.0	......	......	......	(3)	[4] 15	(3)	41,215	727.15	92
......	......	......	......	135,500	......	35.2	......	......	25.6	9.6	1,680	[4] 17	6,300	11,743	208.28	93
......	......	......	......	......	......	111.4	......	30.2	81.2	......	971	(7)	1,456	10,665	192.93	94
......	......	......	......	280,000	......	6.8	6.8	......	......	......	(3)	[4] 15	(3)	(3)	......	95
......	......	......	......	18,790	......	24.0	20.0	4.0	......	......	(3)	[4] 37	19,296	33,265	620.50	96
101,575	406,300	4.0	52	......	101,575	70.0	70.0	......	......	......	(3)	33	22,464	25,176	472.61	97
......	......	......	......	242,020	......	27.5	......	......	......	27.5	(3)	38	7,086	21,366	401.92	98
......	......	......	......	312,176	......	58.2	9.3	38.8	......	10.1	500	[4] 40	6,100	16,528	313.51	99
......	......	......	......	......	......	4.2	......	2.8	1.4	......	(3)	[4] 33	15,960	17,036	327.05	100
......	......	......	......	......	......	57.5	......	31.5	......	26.0	(3)	[4] 49	(3)	10,412	201.28	101
......	......	......	......	......	......	2.0	1.4	0.6	......	......	20	[4] 24	4,070	11,236	219.07	102
(3)	(3)	(3)	(3)	......	......	......	......	......	......	......	(3)	[4] 29	(3)	17,761	346.56	103
264,000	528,000	2.0	35	......	264,000	8.8	......	8.8	......	......	(3)	[4] 34	4,000	17,400	343.53	104
......	......	......	......	......	......	84.6	0.1	20.1	64.4	......	915	[4] 21	1,340	24,800	494.62	105

[4] Some employees engaged on street cleaning are reported with employees of another department.

[5] Includes areas of some streets with oil or water bound surface.

[6] Includes part of the expenses of refuse disposal.

[7] Reported with the employees of another department.

TABLE 13.—STREET CLEANING—GENERAL

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see

City number.	CITY.	Total area (square yards) of paved streets and alleys.	PAVED STREETS AND ALLEYS REGULARLY CLEANED.					By hand sweeping.				By machine sweeping.			
			Area (square yards) subject to cleaning.	Per cent of total area of paved streets cleaned.	Amount (square yards) of cleaning done per week.	Average number of cleanings per week.	Quantity (cubic yards) of street sweepings removed.	Area (square yards) subject to cleaning.	Amount (square yards) of cleaning done per week.	Average number of cleanings per week.	Weeks in cleaning season.	Area (square yards) subject to cleaning.	Amount (square yards) of cleaning done per week.	Average number of cleanings per week.	Weeks in cleaning season.
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.														
106	Saginaw, Mich.	1,239,250	717,751	57.9	5,024,257	7.0	(3)	717,751	5,024,257	7.0	30	......	......	......	......
107	Canton, Ohio	537,631	403,224	75.0	505,224	1.3	1,000	17,000	102,000	6.0	30	......	......	......	......
108	Wichita, Kans.	470,235	263,549	56.0	1,058,877	4.0	24,000	78,000	546,000	7.0	40	......	......	......	......
109	Springfield, Ill.	1,228,217	110,800	9.0	326,800	2.9	9,180	43,200	259,200	6.0	34	......	......	......	......
110	Binghamton N.Y.	372,019	228,148	61.3	891,956	3.9	(3)	50,222	301,332	6.0	32	228,148	590,624	2.6	32
111	Lancaster, Pa.	887,708	150,000	16.9	930,000	6.2	(3)	30,000	180,000	6.0	35	150,000	750,000	5.0	35
112	Sioux City, Iowa	459,441	150,000	32.6	750,000	5.0	12,960	150,000	300,000	2.0	36	150,000	450,000	3.0	36
113	Little Rock, Ark.	588,100	280,900	47.8	1,141,400	4.1	4,707	280,900	1,141,400	4.1	52	......	......	......	......
114	Springfield, Ohio	1,837,116	318,550	17.3	2,593,950	8.1	16,490	318,550	1,513,300	4.8	52	......	......	......	......
115	Atlantic City, N.J.	1,085,762	[1] 548,665	50.5	1,531,990	2.8	65,520	548,665	1,531,990	2.8	52	......	......	......	......
116	Bay City, Mich.	685,476	534,197	77.9	2,670,985	5.0	2,800	534,197	2,136,788	4.0	40	534,197	534,197	1.0	30
117	Rockford, Ill.	1,240,026	102,907	8.3	720,482	7.0	4,320	102,907	617,442	6.0	40	......	......	......	......
118	York, Pa.	548,000	98,000	17.9	588,000	6.0	(3)	98,000	392,000	4.0	35	98,000	196,000	2.0	35
119	Lincoln, Nebr.	823,100	608,660	73.9	1,117,320	1.8	6,000	75,000	525,000	7.0	40	533,660	592,320	1.1	40
120	Chattanooga, Tenn.	539,138	280,542	52.0	895,475	3.2	8,451	46,278	277,668	6.0	52	280,542	617,807	2.2	52
121	Topeka, Kans.	960,443	197,500	20.6	736,000	3.7	20,158	124,500	538,500	4.3	42	197,500	197,500	1.0	42
122	Sacramento, Cal.	1,573,579	[1] 901,120	57.3	6,504,960	7.2	14,400	901,120	5,406,720	6.0	52	366,080	1,098,240	3.0	52
123	Malden, Mass.	1,302,144	20,000	1.5	20,000	1.0	(3)	......	......	......	......	20,000	20,000	1.0	30
124	Haverhill, Mass.	363,651	73,000	20.1	146,000	2.0	(3)	73,000	146,000	2.0	34	......	......	......	......
125	Pueblo, Colo.	161,729	141,518	87.5	1,746,053	12.3	6,205	141,518	849,108	6.0	52	128,135	896,945	7.0	52
126	Salem, Mass.	965,264	91,537	9.5	671,272	7.3	10,318	91,537	488,198	5.3	43	91,537	183,074	2.0	40
127	New Britain, Conn.	401,340	3,580	0.9	21,480	6.0	1,260	3,580	21,480	6.0	35	......	......	......	......
128	Davenport, Iowa	1,219,532	336,000	27.6	1,462,400	4.4	13,300	192,000	768,000	4.0	34	336,000	694,400	2.1	34
129	McKeesport, Pa.	460,689	331,840	72.0	811,840	2.4	6,912	8,000	48,000	6.0	40	323,840	675,840	2.1	40
130	Wheeling, W. Va.	631,927	150,000	23.7	405,600	2.7	9,491	150,000	300,000	2.0	35	......	......	......	......
131	Augusta, Ga.	1,263,589	165,859	13.1	813,436	4.9	1,630	25,000	150,000	6.0	52	165,859	663,436	4.0	52
132	Superior, Wis.	1,322,452	461,925	34.9	1,745,050	3.8	3,000	......	......	......	......	461,925	1,745,050	3.8	24
133	Newton, Mass.	3,506,920	83,300	2.4	166,600	2.0	4,770	83,300	166,600	2.0	36	......	......	......	......
134	Dubuque, Iowa	1,352,304	160,520	11.9	160,520	1.0	81,600	......	......	......	......	160,520	160,520	1.0	34
135	Butte, Mont.	97,277	93,597	96.2	640,791	6.8	4,160	60,000	360,000	6.0	20	93,597	280,791	3.0	26
136	Chester, Pa.	437,172	150,000	34.3	363,360	2.4	(3)	......	......	......	......	150,000	363,360	2.4	20
137	Kalamazoo, Mich.	365,993	[1] 363,148	99.2	1,058,296	2.9	9,968	83,000	498,000	6.0	39	280,148	560,296	2.0	39
138	Montgomery, Ala.	437,891	[1] 437,891	100.0	2,627,346	6.0	7,000	......	......	......	......	437,891	2,627,346	6.0	52
139	Woonsocket, R. I.	631,947	41,000	6.5	246,000	6.0	810	41,000	246,000	6.0	45	......	......	......	......
140	Galveston, Tex.	830,167	171,016	20.6	1,465,848	8.6	22,932	171,016	732,924	4.3	52	171,016	732,924	4.3	52
141	Fitchburg, Mass.	283,733	80,274	28.3	481,644	6.0	960	80,274	481,644	6.0	38	......	......	......	......
142	Racine, Wis.	450,829	[1] 447,489	99.3	704,029	1.6	(3)	51,308	307,848	6.0	33	396,181	396,181	1.0	33
143	Elmira, N. Y.	936,710	249,147	26.6	891,806	3.6	4,779	116,603	699,618	6.0	28	132,544	192,188	1.4	28
144	Quincy, Ill.	846,068	66,000	7.8	264,000	4.0	2,850	66,000	132,000	2.0	34	......	......	......	......
145	Knoxville, Tenn.	1,422,398	406,274	28.6	613,880	1.5	[2] 4,695	......	......	......	......	......	......	......	......
146	New Castle, Pa.	370,728	216,436	58.3	840,908	3.9	2,475	41,066	246,396	6.0	40	216,436	594,512	2.7	40
147	Macon, Ga.	92,456	92,456	100.0	308,112	3.3	2,808	......	......	......	......	92,456	308,112	3.3	52
148	Auburn, N. Y.	794,322	170,108	21.4	1,573,452	9.2	800	170,108	1,020,648	6.0	32	......	......	......	......
149	West Hoboken, N. J	335,144	248,160	74.0	570,240	2.3	3,960	64,416	386,496	6.0	40	183,744	183,744	1.0	40
150	Joliet, Ill.	686,468	251,084	36.6	1,757,588	7.0	(3)	251,084	1,757,588	7.0	52	......	......	......	......
151	Taunton, Mass.	1,256,141	[1] 165,000	13.1	520,000	3.2	1,230	71,000	426,000	6.0	40	94,000	94,000	1.0	40
152	Everett, Mass.	544,902	23,379	4.3	57,167	2.4	(3)	5,122	35,854	7.0	32	21,313	21,313	1.0	32
153	Oshkosh, Wis.	959,528	312,810	32.6	1,201,488	3.8	(3)	126,954	761,724	6.0	30	185,856	185,856	1.0	30
154	Chelsea, Mass.	657,850	51,600	7.8	51,600	1.0	(3)	......	......	......	......	51,600	51,600	1.0	30
155	Joplin, Mo.	1,137,155	96,100	8.5	316,600	3.3	[2] 2,205	......	......	......	......	......	......	......	......
156	La Crosse, Wis.	764,533	161,939	21.2	971,634	6.0	(3)	161,939	971,634	6.0	32	......	......	......	......
157	Newport, Ky.	624,157	120,000	19.2	120,000	1.0	5,740	......	......	......	......	120,000	120,000	1.0	20
158	South Omaha, Nebr.	317,401	50,000	15.8	155,000	3.1	1,000	15,000	105,000	7.0	52	50,000	50,000	1.0	30

---

[1] The area both hand and machine swept is included under each heading in the preceding columns.
[2] The area both swept and flushed is included under both sweeping and flushing in the preceding columns.
[3] Not reported.
[4] Some employees engaged on street cleaning are reported with employees of another department.

STATISTICS OF STREET CLEANING: 1909—Continued.

page 85. For a text discussion of this table, see page 57. Figures printed in italics are estimates.]

GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.

PAVED STREETS AND ALLEYS REGULARLY CLEANED—contd.						STREETS AND ALLEYS OCCASIONALLY CLEANED.						ALL STREETS AND ALLEYS.				
By flushing.				Area (square yards) subject to both hand and machine sweeping.[1]	Area (square yards) subject to both sweeping and flushing.[2]	Length (miles) of classes subject to cleaning.					Quantity (cubic yards) of street sweepings removed.	Persons employed in street cleaning.	Quantity (cubic yards) of street sweepings removed.	Payments for expenses of street cleaning.		City number.
Area (square yards) subject to cleaning.	Amount (square yards) of cleaning done per week.	Average number of cleanings per week.	Weeks in cleaning season.			Total.	Durably paved.	Macadam.	Gravel.	All other.				Total.	Per 1,000 inhabitants.	
...	...	...	...	...	...	59.0	35.5	23.5	...	...	(3)	[4] 59	(3)	16,584	332.15	106
403,224	403,224	1.0	30	...	17,000	91.0	...	...	91.0	...	(3)	40	1,000	10,913	223.03	107
263,549	512,877	1.9	40	...	78,000	...	...	...	...	...	...	[4] 28	24,000	4,881	100.00	108
67,600	67,600	1.0	34	...	...	48.5	46.8	1.7	...	...	(3)	57	9,180	18,842	386.11	109
...	...	...	...	50,222	...	79.0	...	5.0	10.0	64.0	(3)	17	(3)	9,348	196.88	110
...	...	...	...	30,000	...	40.5	...	40.5	...	...	(3)	[4] 13	(3)	6,961	148.99	111
...	...	...	...	150,000	...	12.8	12.8	...	...	...	(3)	22	12,960	11,013	235.87	112
...	...	...	...	...	...	8.6	0.6	...	...	8.0	(3)	13	4,707	7,354	164.01	113
318,550	1,080,650	3.4	26	...	318,550	47.0	...	...	...	47.0	3,400	[4] 34	19,890	15,108	338.06	114
...	...	...	...	...	...	29.0	...	13.0	16.0	...	(3)	[4] 103	65,520	55,800	1,250.84	115
...	...	...	...	534,197	...	9.4	5.7	3.7	...	...	200	144	3,000	7,461	167.70	116
51,520	103,040	2.0	28	...	51,520	56.9	...	56.9	...	...	(3)	[4] 13	4,320	11,528	260.58	117
...	...	...	...	98,000	...	...	...	...	...	...	...	16	(3)	5,291	121.08	118
...	...	...	...	...	...	...	...	...	...	...	...	[4] 41	6,000	12,393	283.98	119
...	...	...	...	46,278	...	21.6	...	3.3	...	18.3	4,500	22	12,951	16,139	369.91	120
...	...	...	...	124,500	...	30.0	30.0	...	...	...	(3)	[4] 48	20,158	14,384	330.44	121
...	...	...	...	366,080	...	59.5	...	...	19.6	39.9	15,498	[4] 59	29,898	33,103	763.97	122
...	...	...	...	...	...	(3)	(3)	(3)	(3)	(3)	(3)	[4] 6	(3)	2,000	46.21	123
...	...	...	...	...	...	100.0	3.4	96.6	(6)	...	(3)	[4] 18	(3)	5,943	138.21	124
...	...	...	...	128,135	...	4.4	4.4	...	...	...	(3)	19	6,205	14,139	328.81	125
...	...	...	...	91,537	...	50.1	2.0	24.9	23.2	...	(3)	[4] 16	10,318	8,915	209.13	126
...	...	...	...	...	...	22.6	...	22.6	...	...	1,350	[4] 8	2,610	4,824	113.45	127
...	...	...	...	192,000	...	129.2	38.4	0.8	...	90.0	(3)	45	13,300	28,108	661.36	128
88,000	88,000	1.0	12	...	88,000	6.5	6.5	...	...	...	80	30	6,992	17,821	424.01	129
105,600	105,600	1.0	20	...	105,600	31.0	27.0	1.5	2.5	...	3,163	[4] 28	12,654	16,870	407.49	130
...	...	...	...	25,000	...	50.0	...	25.0	25.0	...	2,165	[4] 19	3,796	8,891	217.88	131
...	...	...	...	...	...	(3)	(3)	(3)	(3)	(3)	(3)	[4] 9	3,000	1,005	26.81	132
...	...	...	...	...	...	135.6	...	84.6	51.0	...	(3)	(7)	4,770	(8)	...	133
...	...	...	...	...	...	83.4	0.2	83.2	...	...	(3)	96	81,600	12,134	310.65	134
...	...	...	...	60,000	...	40.0	...	...	...	40.0	(3)	38	4,160	9,817	253.87	135
...	...	...	...	...	...	...	...	...	...	...	...	[4] 13	(3)	5,584	146.45	136
...	...	...	...	...	...	96.0	...	...	...	96.0	10,400	57	20,368	13,519	355.76	137
...	...	...	...	...	...	...	...	...	...	...	...	17	7,000	15,247	402.40	138
...	...	...	...	...	...	45.8	...	15.3	30.5	...	3,600	[4] 10	4,410	4,739	127.87	139
...	...	...	...	171,016	...	32.0	...	...	...	32.0	3,000	22	26,932	16,486	445.81	140
...	...	...	...	...	...	6.0	2.0	4.0	...	...	480	(7)	1,440	11,650	315.04	141
...	...	...	...	...	...	53.0	...	...	...	53.0	(3)	36	(3)	7,308	197.62	142
...	...	...	...	...	...	...	...	...	...	...	...	[4] 19	4,779	6,873	186.16	143
66,000	132,000	2.0	34	...	66,000	91.3	24.6	12.7	...	54.0	(3)	[4] 9	2,850	5,424	148.36	144
406,274	613,880	1.5	52	...	...	60.0	...	45.0	...	15.0	1,350	[4] 19	6,045	7,102	197.17	145
...	...	...	...	41,066	...	15.0	9.0	...	...	6.0	162	15	2,637	9,000	252.67	146
...	...	...	...	...	...	...	...	...	...	...	...	[4] 7	2,808	3,907	110.06	147
170,108	552,804	3.2	25	...	170,108	68.0	...	38.0	...	30.0	5,120	[4] 31	5,920	13,028	379.90	148
...	...	...	...	...	...	7.5	...	2.9	...	4.6	360	17	4,320	11,060	322.73	149
...	...	...	...	...	...	20.1	...	20.1	...	...	(3)	29	(3)	17,512	512.05	150
...	...	...	...	...	...	69.2	0.2	4.0	65.0	...	3,750	[4] 10	4,980	6,728	199.61	151
...	...	...	...	3,056	...	37.0	...	27.2	9.8	...	(3)	[4] 6	(3)	3,943	120.54	152
126,954	253,908	2.0	30	...	126,954	60.7	...	14.1	21.6	25.0	(3)	[4] 26	(3)	7,571	232.10	153
...	...	...	...	...	...	33.0	4.0	19.0	10.0	...	(3)	[4] 8	(3)	6,608	203.64	154
96,100	316,600	3.3	35	...	...	53.8	1.5	52.3	...	...	1,200	9	3,405	4,028	126.11	155
...	...	...	...	...	...	40.4	8.0	32.4	(6)	...	(3)	20	(3)	6,900	226.63	156
...	...	...	...	...	...	19.0	...	19.0	...	...	(3)	19	5,740	5,934	196.95	157
...	...	...	...	15,000	...	90.0	...	...	...	90.0	(3)	[4] 13	1,000	2,700	102.90	158

---

[5] Includes areas of some streets with oil or water bound surface.

[6] Gravel streets cleaned are included with macadam streets.

[7] Reported with employees of another department.

[8] Expenses reported with those of another department.

[9] Sweepings from gutters after flushing of streets.

TABLE 14.—STREET CLEANING—AREA (SQUARE YARDS) OF PAVED STREETS AND ALLEYS REGULARLY CLEANED, BY SPECIFIED METHODS AND WITH STATED FREQUENCY: 1909.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 58. Figures printed in italics are estimates.]

City number.	CITY.	BY HAND SWEEPING.					BY MACHINE SWEEPING.					BY FLUSHING.				
		Total.	1 or 2 times per week.	3 or 4 times per week.	5 or 6 times per week.	7 or more times per week.	Total.	1 or 2 times per week.	3 or 4 times per week.	5 or 6 times per week.	7 or more times per week.	Total.	1 or 2 times per week.	3 or 4 times per week.	5 or 6 times per week.	7 or more times per week.
	Grand total...	98,952,772	18,611,207	5,868,452	43,814,395	30,177,182	86,256,598	47,247,137	10,720,286	21,389,804	3,524,299	33,372,653	24,797,076	3,176,888	3,803,304	1,595,385
	Group I...	56,194,892	9,633,196	2,497,196	18,386,390	25,196,574	43,466,405	24,916,066	3,585,454	14,964,885	...	17,985,758	15,828,248	102,853	2,054,657	...
	Group II...	18,394,728	3,227,862	1,407,597	11,259,638	2,499,631	19,377,950	7,532,847	3,251,054	2,203,534	3,015,443	9,212,858	4,739,822	2,162,187	1,091,577	1,219,272
	Group III...	17,903,037	4,546,556	862,950	11,168,011	1,325,520	16,509,518	10,175,496	2,915,788	3,091,099	327,135	4,010,558	2,585,285	437,350	611,810	376,113
	Group IV...	6,460,115	1,203,593	1,100,709	3,000,356	1,155,457	6,902,725	4,622,728	967,990	1,130,286	181,721	2,163,479	1,643,721	474,498	45,260	...
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.															
1	New York, N. Y...	30,115,905	2,380,500	1,118,700	1,574,631	25,042,074	1,319,034	1,065,594	42,240	211,200	...	...	...	...	...	...
2	Chicago, Ill...	(1)	(1)	(1)	(1)	(1)	...	...	...	...	...	(1)	(1)	(1)	(1)	(1)
3	Philadelphia, Pa...	7,031,225	...	...	7,031,225	...	16,698,182	7,031,225	...	9,666,957	...	...	...	...	...	...
4	St. Louis, Mo...	3,676,864	1,478,805	...	2,198,059	...	2,373,340	2,373,340	...	...	...	3,478,930	3,478,930	...	...	...
5	Boston, Mass...	481,536	(2)	(2)	(2)	(2)	2,831,000	1,695,000	592,000	544,000	...	387,430	387,430	...	...	...
6	Baltimore, Md...	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
7	Cleveland, Ohio...	750,740	...	...	721,000	29,740	...	...	...	...	...	7,403,373	7,403,373	...	...	...
8	Pittsburgh, Pa...	*1,650,000*	*450,000*	...	*1,200,000*	...	*4,680,000*	*2,700,000*	...	*1,980,000*	...	*379,500*	*345,000*	...	*34,500*	...
9	Detroit, Mich...	1,138,668	1,138,668	...	...	...	3,264,009	3,264,009	...	...	...	3,320,368	3,267,165	53,203	...	...
10	Buffalo, N. Y...	1,191,546	...	...	1,191,546	...	6,926,350	4,991,639	1,305,747	628,964	...	...	...	...	...	...
11	San Francisco, Cal...	2,261,001	1,452,692	337,579	345,970	124,760	184,719	77,927	50,214	56,578	...	...	...	...	...	...
12	Cincinnati, Ohio...	1,430,422	305,931	...	1,124,491	...	1,253,039	...	...	1,253,039	...	1,253,039	...	...	1,253,039	...
13	Milwaukee, Wis...	*1,025,657*	...	...	*1,025,657*	...	*348,622*	*348,622*	...			*665,000*	...	...	*665,000*	...
14	Newark, N. J...	3,010,432	1,969,515	1,040,917	...	...	1,349,655	1,349,655	...	...	...	946,350	946,350	...	...	...
15	New Orleans, La...	420,420	260,195	...	160,225	...	330,905	19,055	16,432	295,418	...	151,768	...	49,650	102,118	...
16	Washington, D. C...	2,010,476	196,890	...	1,813,586	...	1,907,550	...	1,578,821	328,729	...	...	...	...	...	...
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.															
17	Minneapolis, Minn...	163,073	...	...	163,073	...	1,575,623	...	1,575,623	...	...	163,073	...	...	163,073	...
18	Los Angeles, Cal...	1,173,334	...	234,667	938,667	...	855,738	92,918	207,801	555,019	...	1,220,267	704,000	234,667	281,600	...
19	Jersey City, N. J...	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	...	...	...	...	...
20	Kansas City, Mo...	3,382,049	1,606,708	768,654	1,006,687	...	687,300	687,300	...	...	...	1,610,322	1,079,199	341,790	189,333	...
21	Indianapolis, Ind...	*3,375,072*	...	...	*3,375,072*	...	*3,375,072*	...	...	...	...	*176,000*	...	...	...	*176,000*
22	Louisville, Ky...	*352,500*	*88,500*	*88,000*	*176,000*	...	*440,000*	*140,000*	*200,000*	*100,000*	...	*1,865,600*	*880,000*	*985,600*	...	...
23	Seattle, Wash...	*22,180*	...	...	*22,180*	...	*134,410*	...	*50,280*	*84,130*	...	*272,500*	...	...	272,500	...
24	Providence, R. I...	270,927	...	...	270,927	...	802,417	802,417	...	...	...	...	...	...	...	...
25	Rochester, N. Y...	2,026,325	374,671	233,597	1,418,057	...	880,479	661,406	176,428	42,645	...	289,311	...	289,311	...	...
26	St. Paul, Minn...	991,311	...	...	991,311	...	...	...	...	...	...	495,656	330,437	165,219	...	...
27	Denver, Colo...	160,000	...	...	...	160,000	740,000	...	...	...	740,000	240,000	...	...	...	240,000
28	Portland, Oreg...	4,000	...	...	...	4,000	1,133,900	443,700	...	...	690,200	...	...	...	...	...
29	Columbus, Ohio...	320,508	...	...	320,508	...	2,510,767	2,439,478	67,211	4,078	...	777,000	777,000	...	...	...
30	Toledo, Ohio...	620,283	...	...	...	620,283	...	...	...	...	...	*110,600*	...	*110,600*	...	...
31	Worcester, Mass...	*182,391*	...	...	*182,391*	...	*322,611*	*322,611*	...	...	...	...	...	...	...	...
32	Atlanta, Ga...	278,775	...	...	...	278,775	1,168,640	...	...	...	1,168,640	278,775	...	...	...	278,775
33	Syracuse, N. Y...	1,257,656	...	...	...	1,257,656	416,603	...	...	...	416,603	524,497	...	...	...	524,497
34	New Haven, Conn...	361,293	...	...	361,293	...	361,293	...	361,293	...	...	...	...	...	...	...
35	Scranton, Pa...	313,935	138,864	...	175,071	...	531,468	...	265,018	266,450	...	595,217	420,146	...	175,071	...
36	Paterson, N. J...	298,888	140,656	...	158,232	...	263,730	263,730	...	...	...	...	...	...	...	...
37	Omaha, Nebr...	46,000	...	...	46,000	...	100,000	100,000	...	...	...	35,000	...	35,000	...	...
38	Fall River, Mass...	225,000	...	...	225,000	...	...	...	...	...	...	...	...	...	...	...
39	Memphis, Tenn...	*162,624*	*57,024*	*42,240*	*63,360*	...	*366,432*	*60,000*	...	*306,432*	...	*503,040*	*493,040*	...	*10,000*	...
40	Richmond, Va...	151,200	151,200	...	...	...	993,987	646,587	347,400	...	...	...	...	...	...	...
41	Oakland, Cal...	117,330	...	...	117,330	...	551,480	...	...	551,480	...	56,000	56,000	...	...	...
42	Grand Rapids, Mich	*168,000*	...	...	*168,000*	...	*793,500*	*793,500*	...	...	...	...	...	...	...	...
43	Nashville, Tenn...	307,486	31,666	...	275,820	...	293,300	...	...	293,300	...	...	...	...	...	...
44	Lowell, Mass...	*205,920*	...	...	*205,920*	...	*79,200*	*79,200*	...	...	...	...	...	...	...	...
45	Cambridge, Mass...	199,609	...	...	199,609	...	...	...	...	...	...	...	...	...	...	...
46	Dayton, Ohio...	1,257,059	638,573	40,439	399,130	178,917	...	...	...	...	...	...	...	...	...	...

[1] No record.

[2] No data for times per week.

TABLE 14.—STREET CLEANING—AREA (SQUARE YARDS) OF PAVED STREETS AND ALLEYS REGULARLY CLEANED, BY SPECIFIED METHODS AND WITH STATED FREQUENCY: 1909—Continued.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 58. Figures printed in italics are estimates.]

City number.	CITY.	BY HAND SWEEPING.					BY MACHINE SWEEPING.					BY FLUSHING.				
		Total.	1 or 2 times per week.	3 or 4 times per week.	5 or 6 times per week.	7 or more times per week.	Total.	1 or 2 times per week.	3 or 4 times per week.	5 or 6 times per week.	7 or more times per week.	Total.	1 or 2 times per week.	3 or 4 times per week.	5 or 6 times per week.	7 or more times per week.
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.															
47	Albany, N. Y.	300,000				300,000	1,313,545	1,313,545				39,000		39,000		
48	Bridgeport, Conn.	141,401			141,401		27,717	27,717								
49	Spokane, Wash.	160,400			160,400		414,000			414.000		160,400		160,400		
50	Hartford, Conn.	224,000				224,000	85,000	10,000			75,000	85,000	10,000			75,000
51	Reading, Pa.	290,000			290,000							145,000	145,000			
52	Trenton, N. J.	549,927			549,927											
53	San Antonio, Tex.	203,730			203,730		203,730			203,730						
54	New Bedford, Mass.	170,968				170,968	85,484	85,484				45,234	45,234			
55	Camden, N. J.	350,000			350,000		413,892	413,892								
56	Dallas, Tex.	344,100			344,100		216,900			216,900		344,100	344,100			
57	Salt Lake City, Utah	260,500			260,500		504,420	504,420				177,000			177,000	
58	Lynn, Mass.	191,582				191,582	191,582		191,582							
59	Wilmington, Del.	*525,000*	*485,000*		*40,000*		*525,000*	*525,000*				*80,000*	*80,000*			
60	Springfield, Mass.	177,471				177,471	173,604	73,248	46,328	54,028		34,615		34,615		
61	Des Moines, Iowa	123,050	123,050				58,006			58,006		96,546				96,546
62	Lawrence, Mass.	97,155	5,700		91,455		122,886	122,886								
63	St. Joseph, Mo.	460,800			460,800							345,600	184,320		161,280	
64	Troy, N. Y.	800,000			800,000		400,000	200.000	200,000			315,000	200,000	70,000	45,000	
65	Yonkers, N. Y.	1,499,148	1,292,000			207,148	54,973			54,973						
66	Tacoma, Wash.	290,319			290,319		157,290			157,290		31,760		31,760		
67	Youngstown, Ohio.	108,120			108,120							685,880	636,600			49,280
68	Duluth, Minn.	165,640			165,640		115,856	115,856				94,381	94,381			
69	Houston, Tex.	505,068	326,568		178,500		505,068	326,568		178,500		178,500			178,500	
70	Somerville, Mass.	*25,000*			*25,000*		*1,025,925*	*1,025,925*								
71	Kansas City, Kans.	*511,492*	*446,380*		65,112											
72	Utica, N. Y.	1,121,592			1,121,592		1,121,592		752,832	368,760						
73	Waterbury, Conn.	193,205			193,205											
74	Elizabeth, N. J.	793,745	3,000	450,185	340,560		250,940			250,940						
75	Schenectady, N. Y.	506,878			506,878		772,016	4,078	552,333	215,605		50,030			50,030	
76	Hoboken, N. J.	293,905	293,905				188,249			188,249						
77	Manchester, N. H.	112,273			112,273		184,773	184,773				75,570	75,570			
78	Evansville, Ind.	152,560			152,560		840,978	723,560	88,311	29,107						
79	Birmingham, Ala.						508,334	375,134		133,200						
80	Akron, Ohio	*250,000*			*250,000*							*250,000*	*250,000*			
81	Norfolk, Va.	276,648	45,354		231.294		460,246	283,957	107,560	68.729						
82	Fort Worth, Tex.	155,287			100.936	54,351	155,287			155,287		155,287				155,287
83	Wilkes-Barre, Pa.	82,578	7,473		75,105		435,666	224,787	108,693	102,186						
84	Erie, Pa.	896,455	831,995		64,460											
85	Savannah, Ga.	140,814			140,814		638,353	130,759	255,459		252,135					
86	Peoria, Ill.	*497,554*	*102,444*	*53,333*	*341,777*		*574,222*	*574,222*								
87	Harrisburg, Pa.	762,000			762,000											
88	Fort Wayne, Ind.	*512,161*			*512,161*		*335,479*	*335,479*				*256,080*	*256,080*			
89	Charleston, S. C.	82,433			82,433		410,935	81,026	329,909							
90	Portland, Me.	*320,272*	*213,515*	*106,757*												
91	Terre Haute, Ind.	505,350		252,675	252,675											
92	East St. Louis, Ill.	*75,084*			*75,084*											
93	Holyoke, Mass.	202,648			202,648		213,148	213,148								
94	Brockton, Mass.						164,266	164,266								
95	Johnstown, Pa.	280,000			280,000		280,000	280,000								
96	Jacksonville, Fla.	18,790			18,790		422,815		181,206	241,609						
97	Oklahoma City, Okla.						101,575		101,575			101,575		101,575		
98	Bayonne, N. J.	242,020			242,020		242,020	242,020								
99	Covington, Ky.	312,176	234,891		77,285		312,176	312,176								
100	South Bend, Ind.	*140,800*			*140,800*		*941,050*	*941,050*								
101	Passaic, N. J.	54,770			54,770											
102	Altoona, Pa.	*27,000*			*27,000*		*360,520*	*360,520*								
103	Mobile, Ala.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
104	Allentown, Pa.	264,000			264,000							264,000	264,000			
105	Pawtucket, R. I.	155,168	135,281		19,887											

[1] No record.

TABLE 14.—STREET CLEANING—AREA (SQUARE YARDS) OF PAVED STREETS AND ALLEYS REGULARLY CLEANED, BY SPECIFIED METHODS AND WITH STATED FREQUENCY: 1909—Continued.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 58. Figures printed in italics are estimates.]

City number.	CITY.	BY HAND SWEEPING.					BY MACHINE SWEEPING.					BY FLUSHING.				
		Total.	1 or 2 times per week.	3 or 4 times per week.	5 or 6 times per week.	7 or more times per week.	Total.	1 or 2 times per week.	3 or 4 times per week.	5 or 6 times per week.	7 or more times per week.	Total.	1 or 2 times per week.	3 or 4 times per week.	5 or 6 times per week.	7 or more times per week.
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.															
106	Saginaw, Mich.	*717,751*				*717,751*										
107	Canton, Ohio	17,000			17,000							403,224	403,224			
108	Wichita, Kans.	78,000				78,						263,549	263,549			
109	Springfield, Ill	43,200			43,200							67,600	67,600			
110	Binghamton, N. Y.	50,222			50,222	000	228,148	174,562			53,586					
111	Lancaster, Pa.	30,000			30,000	000	150,000			150,000						
112	Sioux City, Iowa	*150,000*	*150,000*			200	*150,000*		*150,000*							
113	Little Rock, Ark.	*280,900*	*136,000*		*144,900*	222										
114	Springfield, Ohio	318,550	32,000	135,000	151,550							318,550		318,550		
115	Atlantic City, N. J.	548,665	440,000		108,665	000 *000*										
116	Bay City, Mich.	534,197		534,197		*900*	534,197	534,197								
117	Rockford, Ill	102,907			102,907	550						51,520	51,520			
118	York, Pa.	98,000		98,000		665	98,000	98,000								
119	Lincoln, Nebr.	*75,000*				*75,*	533,660	533,660								
120	Chattanooga, Tenn.	46,278			46,278	197 907	280,542	222,866		57,676						
121	Topeka, Kans.	*124,500*		*111,000*		*13,* 000	*197,500*	*197,500*								
122	Sacramento, Cal.	901,120			901,120	*000*	366,080		366,080							
123	Malden, Mass.					278	20,000	20,000								
124	Haverhill, Mass.	*73,000*	*73,000*													
125	Pueblo, Colo.	141,518			141,518	*500* 120	128,135				128,135					
126	Salem, Mass.	91,537		30,512	61,025		91,537	91,537								
127	New Britain, Conn.	3,580			3,580	*000* 18										
128	Davenport, Iowa	192,000		192,000			336,000	*156,800*	179,200							
129	McKeesport, Pa.	8,000			8,000	537	323,840	263,440		70,400		*85.000*	*88,000*			
130	Wheeling, W. Va.	150,000	150,000			580						105,600	105,600			
131	Augusta, Ga.	*25,000*			*25,000*	000	165,859		165,859							
132	Superior, Wis.					000	461,925	256,625		205,300						
133	Newton, Mass.	83,300	83,300			000										
134	Dubuque, Iowa						160,520	160,520								
135	Butte, Mont.	*60,000*			*60,000*	*000*	93,597		93,597							
136	Chester, Pa.					300	*150,000*	*134,160*		*15,840*						
137	Kalamazoo, Mich.	83,000			83,000		280,148	280,148								
138	Montgomery, Ala.					*000*	437,891			437,891						
139	Woonsocket, R. I.	41,000			41,000											
140	Galveston, Tex.	171,016	73,293		97,723	000	171,016	73,293		97,723						
141	Fitchburg, Mass.	80,274			80,274											
142	Racine, Wis.	51,308			51,308	000	396,181	396,181								
143	Elmira, N. Y.	116,603			116,603	6	132,544	119,290	13,254							
144	Quincy, Ill	*66,000*	*66,000*			4						*66,000*	*66,000*			
145	Knoxville, Tenn.					308						406,274	406,274			
146	New Castle, Pa.	41,066			41,066	603	216,436	151,780		64,656						
147	Macon, Ga.					*000*	*92,456*	*61,656*		*30,800*						
148	Auburn, N. Y.	170,108			170,108							170,108		155,948	14,160	
149	West Hoboken, N. J	64,416			64,416		183,744	183,744								
150	Joliet, Ill.	251,084				251, 066										
151	Taunton, Mass.	71,000			71,000	108	94,000	94,000								
152	Everett, Mass.	5,122				5, 6	21,313	21,313								
153	Oshkosh, Wis.	126,954			126,954	084	185,856	185,856				126,954	126,954			
154	Chelsea, Mass.					000	*51,600*	*51,600*								
155	Joplin, Mo.					122						96,100	65,000		31,100	
156	La Crosse, Wis.	161,939			161,939	954										
157	Newport, Ky.						120,000	120,000								
158	South Omaha, Nebr	*15,000*				*15,* 939 *000*	*50,000*	*50,000*								

TABLE 15.—STREET CLEANING—AVERAGE NUMBER OF EMPLOYEES DURING THE STREET-CLEANING SEASON: 1909.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 58. Figures printed in italics are estimates.]

City number.	CITY.	Total.	CLASSES OF EMPLOYEES.						BRANCHES OF STREET-CLEANING SERVICE IN WHICH EMPLOYED.				
			Superintendent.	Foremen and inspectors.	Mechanics and other skilled laborers.	Teamsters.	Unskilled laborers.	All others.	Hand sweeping.	Machine sweeping.	Flushing.	Hauling.	All others.
	Grand total	22,560	165	1,084	234	5,086	15,767	224	13,153	1,711	724	4,205	2,767
	Group I	13,963	73	783	174	3,103	9,656	174	8,774	783	364	2,739	1,303
	Group II	4,052	39	142	19	928	2,892	32	2,023	362	189	677	801
	Group III	3,072	22	112	20	687	2,222	9	1,750	362	125	502	333
	Group IV	1,473	31	47	21	368	997	9	606	204	46	287	330
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.												
1	New York, N. Y	4,782	29	370	125	479	3,683	96	3,458	9	....	470	845
2	Chicago, Ill	1,153	(1)	54	....	163	936	....	976	....	14	163	....
3	Philadelphia, Pa	2,755	1	23	....	1,302	1,419	10	1,419	60	....	1,242	34
4	St. Louis, Mo	1,275	3	83	1	256	930	2	931	18	150	164	12
5	Boston, Mass	529	(1)	47	....	119	359	4	206	24	6	91	202
6	Baltimore, Md	437	11	22	....	168	236	....	....	254	....	150	33
7	Cleveland, Ohio	329	2	25	6	89	196	11	106	2	103	89	29
8	Pittsburgh, Pa	611	7	47	....	86	467	4	365	155	32	51	8
9	Detroit, Mich	386	1	27	....	75	283	....	278	15	15	50	28
10	Buffalo, N. Y	241	(1)	17	5	24	195	....	135	77	....	24	5
11	San Francisco, Cal	175	1	8	....	41	120	5	126	10	3	30	6
12	Cincinnati, Ohio	366	3	13	26	75	233	16	243	14	29	36	44
13	Milwaukee, Wis	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
14	Newark, N. J	332	5	29	3	65	224	6	160	88	6	65	13
15	New Orleans, La	194	8	11	5	42	125	3	125	12	6	24	27
16	Washington, D. C	398	2	7	3	119	250	17	246	45	....	90	17
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.												
17	Minneapolis, Minn	321	13	....	1	53	254	....	31	22	8	27	233
18	Los Angeles, Cal	206	(1)	7	1	71	127	....	61	21	7	61	56
19	Jersey City, N. J	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
20	Kansas City, Mo	321	7	21	....	63	225	5	229	3	43	34	12
21	Indianapolis, Ind	223	2	7	2	54	157	1	147	27	7	29	13
22	Louisville, Ky	282	1	11	....	69	190	2	210	11	7	52	2
23	Seattle, Wash	168	1	14	2	52	99	....	54	12	29	35	38
24	Providence, R. I	167	1	3	1	51	110	1	52	28	....	46	41
25	Rochester, N. Y	313	(1)	13	....	60	240	(1)	253	9	4	47	....
26	St. Paul, Minn	170	1	1	....	15	153	....	146	....	10	11	3
27	Denver, Colo	98	1	4	2	52	34	5	28	15	7	36	12
28	Portland, Oreg	127	1	3	3	46	66	8	10	31	....	32	54
29	Columbus, Ohio	100	1	9	2	34	53	1	40	29	5	21	5
30	Toledo, Ohio	107	2	5	....	12	88	....	68	7	9	16	7
31	Worcester, Mass	56	(1)	2	4	5	45	....	37	9	....	4	6
32	Atlanta, Ga	63	1	1	....	34	27	....	27	9	3	22	2
33	Syracuse, N. Y	265	1	3	....	24	233	4	147	2	12	15	89
34	New Haven, Conn	87	(1)	2	....	15	70	....	50	4	....	16	17
35	Scranton, Pa	138	(1)	2	....	16	120	....	40	60	20	16	2
36	Paterson, N. J	36	1	1	....	12	21	1	15	9	....	10	2
37	Omaha, Nebr	60	1	4	....	13	41	1	37	11	4	6	2
38	Fall River, Mass	62	(1)	1	....	10	51	....	51	....	....	10	1
39	Memphis, Tenn	85	(1)	3	....	19	63	....	20	5	5	14	41
40	Richmond, Va	60	(1)	3	....	25	32	....	32	6	....	19	3
41	Oakland, Cal	130	2	14	....	36	76	2	22	10	4	22	72
42	Grand Rapids, Mich	90	(1)	(1)	....	20	70	....	36	4	5	16	29
43	Nashville, Tenn	48	(1)	2	....	21	25	....	20	4	....	17	7
44	Lowell, Mass	83	1	3	....	8	71	(1)	60	12	....	7	4
45	Cambridge, Mass	80	(1)	2	....	18	60	(1)	18	2	....	16	44
46	Dayton, Ohio	106	1	1	1	20	82	1	82	....	....	20	4

---

[1] Employees reported with those of other departments.

[2] Not reported.

TABLE 15.—STREET CLEANING—AVERAGE NUMBER OF EMPLOYEES DURING THE STREET-CLEANING SEASON: 1909—Continued.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 58. Figures printed in italics are estimates.]

City number.	CITY.	Total.	CLASSES OF EMPLOYEES.						BRANCHES OF STREET-CLEANING SERVICE IN WHICH EMPLOYED.				
			Superintendent.	Foremen and inspectors.	Mechanics and other skilled laborers.	Teamsters.	Unskilled laborers.	All others.	Hand sweeping.	Machine sweeping.	Flushing.	Hauling.	All others.
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.												
47	Albany, N. Y.	98	1	5	2	26	64		21	52	7	16	2
48	Bridgeport, Conn.	81	1	3		19	58	(1)	35	3		16	27
49	Spokane, Wash.	56	(1)	1		20	35		12	10	3	20	11
50	Hartford, Conn.	95	(1)	6		23	66	(1)	70	2	2	19	2
51	Reading, Pa.	24		1		6	17		17		4	2	1
52	Trenton, N. J.	88	(1)	2		4	82		82			4	2
53	San Antonio, Tex.	52	2	1		12	37		37	5		7	3
54	New Bedford, Mass.	54	(1)	2		8	44		20	1	1	7	25
55	Camden, N. J.	43	(1)	1		12	30		16	14		12	1
56	Dallas, Tex.	49	1	7		16	25		22	6	4	9	8
57	Salt Lake City, Utah	73	(1)	1		22	50	(1)	33	4	13	22	1
58	Lynn, Mass.	20		2		6	12		14	3		3	
59	Wilmington, Del.	57	(1)			13	44		41	2	1	10	3
60	Springfield, Mass.	60	(1)	2		8	50		25	11	3	8	13
61	Des Moines, Iowa	52	1	1		20	30		10	13	12	12	5
62	Lawrence, Mass.	27	(1)	2		8	17	(1)	11	11		5	
63	St. Joseph, Mo.	40	1	1		6	32		22		12	4	2
64	Troy, N. Y.	231	(1)	14			217		203	10	4	(1)	14
65	Yonkers, N. Y.	71		2		9	60	(1)	60	1		8	2
66	Tacoma, Wash.	41	(1)	1	(1)	14	26		24	3	6	7	1
67	Youngstown, Ohio	49	1	1		15	32		29		9	9	2
68	Duluth, Minn.	27		2		7	18	(1)	15	3	2	2	5
69	Houston, Tex.	87	1	2	7	21	56		22	6	4	15	40
70	Somerville, Mass.	40	(1)	2		10	28	(1)	10	4		6	20
71	Kansas, City, Kans.	38	1	2		10	24	1	26			10	2
72	Utica, N. Y.	102	(1)	1		31	62	8	62	16		15	9
73	Waterbury, Conn.	50	1	1		3	45	(1)	32			6	12
74	Elizabeth, N. J.	68	(1)	2		20	46		30	20		16	2
75	Schenectady, N. Y.	100	(1)	5	1	23	71		35	16	6	16	27
76	Hoboken, N. J.	46		1		10	35		16	19		10	1
77	Manchester, N. H.	(1)	(1)	(1)		(1)	(1)		(1)	(1)	(1)	(1)	
78	Evansville, Ind.	20		1		9	10		6	7		6	1
79	Birmingham, Ala.	55	1	2		8	44		48			4	3
80	Akron, Ohio	20	(1)			9	11		7		8	5	
81	Norfolk Va.	78	1	5	4	18	50	(1)	41	13		14	10
82	Fort Worth, Tex.	70	(1)	(1)	2	30	38		33	2	16	14	5
83	Wilkes-Barre, Pa.	49	(1)	1		32	16		16	23		9	1
84	Erie, Pa.	52	1	6		12	33	(1)	39			12	1
85	Savannah, Ga.	52	1	3		28	20		20	2		26	4
86	Peoria, Ill.	41	(1)	2		9	30	(1)	30	3		6	2
87	Harrisburg, Pa.	134	(1)	3		11	120		120			11	3
88	Fort Wayne, Ind.	38	(1)			12	26	(1)	21	3	2	12	
89	Charleston, S. C.	40	1	1	1	8	29		14	2		12	12
90	Portland, Me.	82	1	5	1	3	72		78			3	1
91	Terre Haute, Ind.	37	2			11	24		24			11	2
92	East St. Louis, Ill.	15	(1)	1		2	12	(1)	10	3		2	(1)
93	Holyoke, Mass.	17	(1)	1		7	9	(1)	7	1		6	3
94	Brockton, Mass.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
95	Johnstown, Pa.	15	(1)	1		4	10		10	1		3	1
96	Jacksonville, Fla.	37	(1)	1		12	24		10	6		6	15
97	Oklahoma, City, Okla.	33	1	2		10	20			22	2	6	3
98	Bayonne, N. J.	38	1			4	33		15	18		4	1
99	Covington, Ky.	40	(1)	1	1	12	26		7	6	0	8	19
100	South Bend, Ind.	33	(1)			8	25	(1)	25	2		6	
101	Passaic, N. J.	49	(1)	1		2	46		46			2	1
102	Altoona, Pa.	24	1	1		5	17		9	10		3	2
103	Mobile, Ala.	29	(1)		1	6	22	(1)	20	3		6	(1)
104	Allentown, Pa.	34	(1)			8	26		26		4	4	(1)
105	Pawtucket, R. I.	21	(1)	(1)		5	16		16			5	

[1] Employees reported with those of other departments.

TABLE 15.—STREET CLEANING—AVERAGE NUMBER OF EMPLOYEES DURING THE STREET-CLEANING SEASON: 1909—Continued.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 58. Figures printed in italics are estimates.]

City number.	CITY.	Total.	CLASSES OF EMPLOYEES.						BRANCHES OF STREET-CLEANING SERVICE IN WHICH EMPLOYED.				
			Superintendent.	Foremen and inspectors.	Mechanics and other skilled laborers.	Teamsters.	Unskilled laborers.	All others.	Hand sweeping.	Machine sweeping.	Flushing.	Hauling.	All others.
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.												
106	Saginaw, Mich.	59	(1)	(1)	(1)	2	57	(1)	51	2		6	
107	Canton, Ohio	40	1			10	29		10		6	7	17
108	Wichita, Kans.	28	2			5	21	(1)	19		2	5	2
109	Springfield, Ill.	57	2			20	35		12		4	16	25
110	Binghamton, N. Y.	17	1			5	11		11	3		2	1
111	Lancaster, Pa.	13	(1)	1		4	8		8	1		3	1
112	Sioux City, Iowa	22	1	1		6	14		14	3		3	2
113	Little Rock, Ark.	13	1			2	10		7			5	1
114	Springfield, Ohio	34	(1)	1	1	7	25		22		4	6	2
115	Atlantic City, N. J.	103	(1)	4		20	79		79			20	4
116	Bay City, Mich.	144	2		20	8	114		40	2		6	96
117	Rockford, Ill.	13	(1)	1		2	10		8		2	2	1
118	York, Pa.	16	1			5	10		10	2		3	1
119	Lincoln, Nebr.	41	2	3		8	28	(1)	8	20		8	5
120	Chattanooga, Tenn.	22	1			6	15		10	7		4	1
121	Topeka, Kans.	48	(1)	(1)		16	32		32	2		14	
122	Sacramento, Cal.	59	(1)	2		15	42	(1)	21	4		12	22
123	Malden, Mass.	6	(1)			1	5	(1)		6			
124	Haverhill, Mass.	18	(1)	2		3	13	(1)	13			3	2
125	Pueblo, Colo.	19	(1)	3		7	9		11	4		4	
126	Salem, Mass.	16	(1)	1		5	10		9	2		4	1
127	New Britain, Conn.	8	(1)	1		2	5	(1)	5			2	1
128	Davenport, Iowa	45	2	2		12	29		18	12		8	7
129	McKeesport, Pa.	30	2			8	19	1	6	16		5	3
130	Wheeling, W. Va.	28	(1)	1		5	22		14		8	5	1
131	Augusta, Ga.	19	(1)	1		10	8		5	6		4	4
132	Superior, Wis.	9	(1)	(1)		5	4	(1)		3		2	4
133	Newton, Mass.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)			(1)	
134	Dubuque, Iowa	96	1	7		31	57			9		30	57
135	Butte, Mont.	38	2			10	23	3	10	18		5	5
136	Chester, Pa.	13	(1)	1		4	8	(1)		8		4	1
137	Kalamazoo, Mich.	57	1	1		25	30		13	2		23	19
138	Montgomery, Ala.	17	2	1		6	8			9		3	5
139	Woonsocket, R. I.	10	(1)	(1)		1	9	(1)	9			1	
140	Galveston, Tex.	22	1	1		9	11		10	1		8	3
141	Fitchburg, Mass.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
142	Racine, Wis.	36	2	3		5	26		8	20		3	5
143	Elmira, N. Y.	19	(1)	1		5	13		9	4		5	1
144	Quincy, Ill.	9	(1)	1		3	5		3		2	3	1
145	Knoxville, Tenn.	19	(1)			5	14				5		14
146	New Castle, Pa.	15	1			5	8	1	4	6	1	3	1
147	Macon, Ga.	7	(1)	1		4	2			1		3	3
148	Auburn, N. Y.	31	(1)			18	13	(1)	13		8	10	
149	West Hoboken, N. J.	17	1	1		4	11		7	5		3	2
150	Joliet, Ill.	29	(1)			2	27		27			2	
151	Taunton, Mass.	10	(1)	(1)		4	6		6	2		2	
152	Everett, Mass.	6	(1)	(1)		4	2	(1)	2	1		3	
153	Oshkosh, Wis.	26	(1)			3	23	(1)	22	2	2	(1)	
154	Chelsea, Mass.	8	(1)	1		3		4		4		3	1
155	Joplin, Mo.	9	1	1		3	4		2		2	2	3
156	La Crosse, Wis.	20	(1)	2		2	16		15			2	3
157	Newport, Ky.	19	1	1		9	8			10		7	2
158	South Omaha, Nebr.	13	(1)			4	9		3	7		3	

---

[1] Employees reported with those of other departments.

TABLE 16.—STREET CLEANING—SNOW AND ICE REMOVAL: 1909.

[Only those cities reporting data for annual snowfall are included in this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 58. Figures printed in italics are estimates.]

City number.	GEOGRAPHIC DIVISION, STATE, AND CITY.	Area (square yards) of paved streets[1] from which snow was removed.	Aggregate snowfall (ins.) during year.	Days' work by city employees.	EXPENSES OF SNOW AND ICE REMOVAL.		
					Total.	Per inch of snowfall per 10,000 square yards of paved streets.	Per 1,000 population.
	Grand total	135,312,348	35.9	200,819	$1,206,542	$2.43	$72.12
	North Atlantic division	82,136,415	34.3	133,434	1,032,970	3.53	92.75
	South Atlantic division	12,945,074	26.5	5,846	9,378	0.27	8.66
	North Central division	40,230,859	42.4	61,539	164,194	0.96	36.40
	I.—CITIES IN STATES OF THE NORTH ATLANTIC DIVISION.						
	Maine:						
90	Portland	606,438	69.1	3.200	$9,711	$2.32	$167.95
	New Hampshire:						
77	Manchester	137,412	51.9	4,095	7,237	10.15	105.04
	Massachusetts:						
5	Boston	2,852,448	20.1	44,223	114,026	19.89	173.47
38	Fall River	280,526	12.3	120	335	0.97	2.87
44	Lowell	399,607	20.1	....	11,993	14.93	115.15
45	Cambridge	432,270	20.1	3,055	5,062	5.83	48.89
54	New Bedford	316,004	25.5	27	220	0.27	2.37
58	Lynn	183,238	28.3	1,800	3,052	5.89	35.01
60	Springfield	217,405	34.0	575	985	1.33	11.43
62	Lawrence	172,252	37.6	1,500	3,000	4.63	36.10
70	Somerville	167,992	20.1	1,325	4,475	13.25	59.01
93	Holyoke	217,172	31.5	425	1,710	2.50	30.33
94	Brockton	205,858	11.0	610	1,371	6.05	24.80
123	Malden	25,242	20.1	250	500	9.87	11.55
124	Haverhill	132,746	20.1	440	1,666	6.25	38.74
126	Salem	*106,604*	28.3	1,170	2,500	8.29	58.64
133	Newton	692,266	20.1	1,400	9,000	6.47	229.12
141	Fitchburg	136,285	39.0	1,200	3,465	6.52	93.70
151	Taunton	96,427	10.5	715	1,064	10.51	31.59
152	Everett	23,379	20.1	700	2,486	52.85	76.00
154	Chelsea	*112,878*	20.1	750	2,142	9.44	66.00
	Rhode Island:						
24	Providence	809,202	20.2	1,400	3,992	2.44	18.17
105	Pawtucket	157,015	[2] 12.8	804	2,340	11.64	46.67
139	Woonsocket	40,822	20.2	715	2,594	31.48	69.99
	Connecticut:						
48	Bridgeport	169,118	18.3	....	500	1.62	5.04
50	Hartford	232,270	32.3	1,100	2,266	3.02	23.31
127	New Britain	3,580	32.3	70	485	41.72	11.41
	New York:						
1	New York	26,470,407	20.7	18,056	707,313	12.91	152.79
10	Buffalo	7,152,445	78.5	936	15,651	0.28	37.69
25	Rochester	2,589,737	66.5	2,139	25,301	1.47	119.54
33	Syracuse	1,365,321	93.2	4,500	[3] 3,312	0.26	24.77
47	Albany	1,468,469	41.4	2,136	3,587	0.59	35.94
64	Troy	833,616	41.4	326	682	0.20	8.89
65	Yonkers	207,148	20.7	1,500	[3] 56	0.13	0.73
72	Utica	1,184,579	101.0	1,226	2,527	0.21	34.86
75	Schenectady	860,974	41.4	1,057	2,500	0.70	35.61
110	Binghamton	279,352	45.8	270	1,891	1.48	39.83
143	Elmira	249,147	43.3	....	1,788	1.66	48.43
148	Auburn	170,109	76.0	....	87	0.07	2.54
	I.—CITIES IN STATES OF THE NORTH ATLANTIC DIVISION—Contd.						
	New Jersey:						
14	Newark	3,413,434	20.7	5,324	$15,265	$2.16	$45.44
76	Hoboken	392,621	20.7	1,200	[3] 287	0.35	4.13
101	Passaic	54,770	21.3	....	291	2.49	5.63
149	West Hoboken	267,560	2.07	350	[3] 28	0.05	0.82
	Pennsylvania:						
3	Philadelphia	16,698,182	20.1	....	7,720	0.19	5.06
8	Pittsburgh	*7,442,803*	20.2	20,721	41,967	2.15	79.53
83	Wilkes-Barre	448,833	46.5	168	2,397	1.15	36.46
84	Erie	896,455	66.5	56	143	0.02	2.19
87	Harrisburg	763,997	35.6	1,800	2,000	0.74	32.74
	II.—CITIES IN STATES OF THE SOUTH ATLANTIC DIVISION.						
	Delaware:						
59	Wilmington	806,455	13.2	6	$39	$0.04	$0.45
	Maryland:						
6	Baltimore	6,482,652	31.7	2,000	2,807	0.14	5.07
	Virginia:						
40	Richmond	1,047,187	25.3	140	316	0.12	2.72
	District of Columbia:						
16	Washington	4,608,780	35.9	3,700	6,216	0.38	19.04
	III.—CITIES IN STATES OF THE NORTH CENTRAL DIVISION.						
	Ohio:						
12	Cincinnati	4,626,512	14.3	5,808	$13,427	$2.03	$37.25
	Indiana:						
78	Evansville	872,197	12.9	66	107	0.10	1.56
	Illinois:						
2	Chicago	15,464,320	26.5	15,843	50,916	1.24	23.77
	Michigan:						
9	Detroit	6,802,342	41.3	1,500	16,443	0.59	36.75
42	Grand Rapids	782,138	35.6	5,000	[3] 2,339	0.84	21.25
106	Saginaw	867,426	72.4	200	1,221	0.19	24.45
116	Bay City	646,708	73.0	600	3,219	0.68	72.35
137	Kalamazoo	355,682	40.0	900	417	0.29	10.97
	Minnesota:						
17	Minneapolis	1,911,713	64.7	13,000	30,892	2.50	104.96
26	St. Paul	1,258,838	67.5	12,000	20,411	2.40	96.48
68	Duluth	649,333	45.7	....	8,024	2.70	105.52
	Wisconsin:						
13	Milwaukee	2,031,558	43.5	4,750	12,206	1.38	33.99
132	Superior	907,808	45.7	133	300	0.07	7.56
142	Racine	385,435	43.5	....	132	0.08	3.57
156	La Crosse	161,939	63.9	360	1,484	1.43	49.17
	Iowa:						
61	Des Moines	1,434,472	30.6	1,027	2,311	0.53	27.32
134	Dubuque	160,520	28.6	240	[3] 150	0.33	3.84
	Missouri:						
63	St. Joseph	911,918	13.5	112	195	0.16	2.52

---

[1] Exclusive of roadways in parks.
[2] Exclusive of snowfall in December.
[3] Part of the expenses of snow and ice removal is included with the expenses of street cleaning.

TABLE 17.—DUST PREVENTION—STREET SPRINKLING [1]

[Cities having no regular sprinkling with water by city are omitted from this table. For a list of the cities arranged alphabetically by states,

City number.	CITY.	Area (square yards) of streets [1] with paved, oil or water bound surface.	NUMBER OF EMPLOYEES—			EQUIPMENT USED.			LENGTH AND AREA REGULARLY SPRINKLED.			
			On cart sprinkling.		On car sprinkling.	Number of horses.	Number of sprinkling carts.	Number of street-car sprinklers.	Length (miles).	Area (square yards).		
			By city employees.	By contractors.						Total.	By cart.	
											By city employees.	By contractors.
	Grand total	268,008,279	1,438	721	240	3,892	2,392	110	7,575.1	147,903,153	95,874,874	34,234,310
	Group I	123,358,956	164	297	42	802	770	20	2,439.8	45,163,655	28,936,167	12,728,022
	Group II	79,357,613	785	243	108	1,869	970	47	3,023.7	61,695,362	42,293,066	11,796,952
	Group III	43,791,114	330	117	61	821	432	28	1,385.1	26,670,633	17,489,591	4,633,499
	Group IV	21,500,596	159	64	29	400	220	15	726.5	14,373,503	7,156,050	5,075,837
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1969.											
1	New York, N. Y	38,204,111	(2)	6	...	[3] 6	225	...	*633.0*	*9,160,538*	*8,808,538*	*352,000*
3	Philadelphia, Pa	16,698,182	...	(4)	...	(4)	(4)	...	(4)	(4)	(4)	(4)
4	St. Louis, Mo	12,647,612	[5] 21	291	...	560	280	...	557.9	12,376,022	(4)	12,376,022
5	Boston, Mass	9,680,322	90	...	...	132	66	...	147.7	2,899,851	2,899,851	...
7	Cleveland, Ohio	7,743,917	...	...	26	...	...	13	200.0	2,112,000	...	...
8	Pittsburgh, Pa	7,610,003	...	...	10	...	...	5	158.2	1,226,133	...	...
11	San Francisco, Cal	7,425,880	20	...	...	40	20	...	155.0	5,356,000	5,356,000	...
13	Milwaukee, Wis	7,810,379	(7)	...	...	(7)	147	...	*452.0*	*9,630,240*	*9,630,240*	...
14	Newark, N. J	3,819,375	...	...	6	...	...	2	11.0	161,333	...	...
15	New Orleans, La	4,719,262	11	...	...	20	10	...	*68.0*	*1,138,024*	*1,138,024*	...
16	Washington, D. C	*6,999,913*	22	...	...	44	22	...	*57.0*	1,103,520	1,103,520	...
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1969.											
17	Minneapolis, Minn	2,170,714	225	...	...	450	225	...	321.2	5,087,650	5,087,650	...
18	Los Angeles, Cal	12,545,860	98	...	...	188	94	...	335.4	8,330,667	8,330,667	...
19	Jersey City, N. J	2,423,156	...	4	4	8	4	2	18.0	316,307	...	316,307
21	Indianapolis, Ind	4,864,555	5	70	...	126	63	...	(4)	*2,825,976*	...	*2,825,976*
22	Louisville, Ky	*4,114,173*	...	...	14	...	...	7	*140.0*	*2,053,300*	...	...
23	Seattle, Wash	2,954,233	...	...	4	...	...	2	16.6	292,160	...	...
24	Providence, R. I	4,340,818	...	...	21	...	...	7	40.0	704,000	...	...
25	Rochester, N. Y	3,173,500	8	48	...	96	48	...	134.7	2,113,165	...	2,113,165
26	St. Paul, Minn	2,298,740	89	...	...	156	78	...	195.0	4,044,105	4,044,105	...
27	Denver, Colo	2,867,116	94	...	...	180	90	...	180.0	4,752,000	4,752,000	...
28	Portland, Oreg	4,162,324	35	...	6	70	35	3	187.0	2,960,350	2,576,000	...
29	Columbus, Ohio	3,697,214	15	...	...	28	14	...	*12.3*	248,824	248,824	...
31	Worcester, Mass	3,304,071	...	39	14	63	34	[3] 6	119.5	2,633,015	...	1,742,848
33	Syracuse, N. Y	1,374,160	3	11	8	22	11	4	92.0	2,166,755	...	1,342,445
34	New Haven, Conn	1,532,523	20	...	4	40	20	2	*134.0*	2,575,000	2,575,000	...
36	Paterson, N. J	1,883,807	...	...	4	...	...	2	*10.0*	*120,000*	...	...
38	Fall River, Mass	*1,508,726*	9	26	9	41	35	3	77.6	1,186,600	213,600	612,500
39	Memphis, Tenn	3,510,425	30	...	4	56	28	2	162.5	3,575,000	3,203,200	...
41	Oakland, Cal	4,749,762	36	30	...	104	64	...	232.1	5,444,266	3,097,600	2,346,666
42	Grand Rapids, Mich	3,561,296	27	...	4	54	27	2	193.0	3,397,152	2,899,072	...
43	Nashville, Tenn	3,129,279	30	...	...	54	27	...	170.0	2,958,000	2,958,000	...
44	Lowell, Mass	2,402,980	11	...	6	20	10	2	43.8	909,096	654,552	...
45	Cambridge, Mass	1,652,796	50	...	...	98	49	...	101.8	1,652,796	1,652,796	...
46	Dayton, Ohio	1,135,385	...	15	6	15	14	3	107.2	1,349,178	...	497,045

---

[1] Exclusive of roadways in parks.

[2] Employees and horses on city work are reported with another department.

[3] For boroughs of Manhattan, Bronx, and Brooklyn only.

[4] Not reported.

WITH WATER BY CITY: 1909.

with the number assigned to each, see page 85. For a text discussion of this table, see page 60. Figures printed in italics are estimates.]

LENGTH AND AREA REGULARLY SPRINKLED—continued.			SCHEDULE OF SPRINKLING SEASON.		Quantity o water used (gallons).	EXPENSES OF SPRINKLING WITH WATER.		City number.
Area (square yards)—Continued.								
By cart—Continued.		By car.	Weeks in sprinkling season.	Frequency of sprinkling.		Total.	Per 1,000 population.	
Per employee.	Per cart.							
60,264	54,393	17,793,969						
90,378	54,109	3,499,466						
52,617	55,763	7,605,344						
49,492	51,211	4,547,543						
54,852	55,599	2,141,616						
GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.								
(7)	40,713		26	3 times daily to 3 times weekly	[3] 375,612,200	(4)	(4)	1
(4)	(4)		24	(4)	(4)	$47,105	$30.86	3
39,667	44,200		52	4 to 8 times a day	1,927,666,620	237,322	370.41	4
32,221	43,937		32	1 to 4 times a day	70,578,000	56,883	261.34	5
		2,112,000	30	(4)	(4)	(4)	(4)	7
		[6] 1,226,133	40	Once a day	(4)	(4)	(4)	8
267,800	267,800		28	2 to 4 times a day	32,667,000	11,619	69.74	11
	65,512		26	2 to 5 times a day	325,000,000	68,400	190.51	13
		161,333	24	(4)	(4)	(4)	(4)	14
103,457	113,802		52	8 times a week	(4)	9,050	27.06	15
50,160	50,160		41	1 to 5 times a day	1,773,000	(4)	(4)	16
GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.								
22,612	22,612		32	2 to 8 times a day	562,500,000	$145,442	$517.47	17
85,007	88,024		29	No schedule	473,499,000	86,400	366.49	18
79,077	79,077	(4)	35	(4)	(4)	4,278	16.36	19
37,680	44,857		28	Twice a day	370,440,000	57,226	254.98	21
		2,053,300	34	(4)	(4)	(4)	(4)	22
		292,160	13	(4)	(4)	1,078	4.87	23
		704,000	30	4 times a day	*77,000,000*	3,615	16.45	24
37,735	44,024		34	3 to 4 times a day	(4)	38,829	186.00	25
45,439	51,848		28	2 to 8 times a day	317,520,000	54,384	283.64	26
50,553	52,800		52	Twice a day	800,000,000	49,877	240.82	27
73,600	73,600	384,350	16	(4)	9,926,400	15,069	107.37	28
16,588	17,773		30	Twice daily	(4)	(4)	(4)	29
44,688	51,260	890,167	30	3 to 10 times daily	102,602,250	(4)	(4)	31
95,889	122,040	824,310	30	No schedule	(4)	21,606	161.56	33
128,750	128,750	(4)	40	(4)	(4)	40,096	305.28	34
		190,000	40	(4)	(4)	(4)	(4)	36
23,603	23,603	360,500	32	2 to 8 times a day	63,900,150	14,998	134.37	38
106,773	114,400	371,800	32	1 to 4 times a day	133,300,000	32,230	276.15	39
82,489	85,067		30	No schedule	14,594,924	54,270	470.03	41
107,373	107,373	498,080	26	2 to 4times a day	89,668,200	17,503	159.03	42
98,600	109,556		30	2 to 5 times a day	207,526,000	27,400	240.83	43
59,505	65,455	254,544	24	2 to 5 times a day	(4)	17,241	165.54	44
33,056	33,731		29	2 to 4 times a day	85,431,250	33,834	337.87	45
33,136	35,503	852,133	25	4 times a day	(4)	2,862	30.82	46

[5] These are inspectors and a small force used when contractor fails to cover his district satisfactorily, expense being deducted from his monthly remittance.
[6] Car sprinkling is for only the width of the street railway tracks.
[7] Reported with the employees of another department.
[8] Includes 2 electric auto sprinklers.

TABLE 17.—DUST PREVENTION—STREET SPRINKLING[1]

[Cities having no regular sprinkling with water by city are omitted from this table. For a list of the cities arranged alphabetically by states,

City number.	CITY.	Area (square yards) of streets[1] with paved, oil or water bound surface.	NUMBER OF EMPLOYEES—			EQUIPMENT USED.			LENGTH AND AREA REGULARLY SPRINKLED.			
			On cart sprinkling.		On car sprinkling.	Number of horses.	Number of sprinkling carts.	Number of street car sprinklers.	Length (miles).	Area (square yards).		
			By city employees.	By contractors.						Total.	By cart.	
											By city employees.	By contractors.
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.											
48	Bridgeport, Conn	*1,448,638*	1	24		40	20		54.8	1,093,875		1,093,875
49	Spokane, Wash	417,838	35		4	68	34	2	*181.0*	*4,062,468*	*3,571,428*	
50	Hartford, Conn	*1,904,270*	15		7	30	15	[3]3	*56.3*	987,920	600,720	
52	Trenton, N. J	710,264	1			1	1		1.0	25,000	25,000	
53	San Antonio, Tex	*3,338,250*	19			38	19		56.6	997,500	997,500	
54	New Bedford, Mass	1,256,447	7	2	6	18	9	3	32.0	557,000	315,000	85,000
56	Dallas, Tex	1,310,399	15		4	30	15	2	67.6	1,310,399	418,539	
57	Salt Lake City, Utah	840,692	39			76	38		(2)	(2)	(2)	
58	Lynn, Mass	576,077		10	6	20	10	3	39.0	777,920		339,093
59	Wilmington, Del	1,094,050	3		4	4	2	2	*50.6*	*811,400*	50,000	
60	Springfield, Mass	2,843,113	19		9	36	18	3	99.0	1,915,760	1,581,360	
62	Lawrence, Mass	633,963	20		2	40	20	1	26.1	584,240	464,640	
64	Troy, N. Y	887,159	13			26	13		*50.0*	*843,000*	*843,000*	
65	Yonkers, N. Y	1,499,148	18			36	18		*36.2*	*499,716*	*499,716*	
66	Tacoma, Wash	1,140,508	2			2	1		3.0	55,000	55,000	
67	Youngstown, Ohio	827,212			4			2	*7.5*	*70,400*		
68	Duluth, Minn	2,800,873	1	20		40	20		23.1	545,274		545,274
69	Houston, Tex	1,266,240	5			10	5		19.9	462,550	462,550	
70	Somerville, Mass	1,050,925	10	32		76	42		76.0	1,337,600	73,876	1,263,724
73	Waterbury, Conn	*316,055*	7		4	14	7	2	26.0	*513,604*	*286,433*	
74	Elizabeth, N. J	947,578	6			12	6		*20.0*	*300,000*	*300,000*	
75	Schenectady, N. Y	895,923	2		4	4	2	2	21.0	419,610	205,219	
77	Manchester, N. H	*620,532*	15			(2)	15		144.6	2,534,023	2,534,023	
78	Evansville, Ind	1,039,330		4		8	4		7.4	260,984		260,984
79	Birmingham, Ala	1,962,731	6		2	12	6	1	18.2	506,334	391,934	
80	Akron, Ohio	1,002,316	2	1		4	2		4.0	*82,000*	*52,000*	*30,000*
81	Norfolk, Va	1,021,570	3			6	3		4.2	77,217	77,217	
85	Savannah, Ga	868,006	4			8	4		*4.0*	88,849	88,849	
90	Portland, Me	*2,252,000*		15	3	25	13	1	*28.0*	*623,700*		*486,486*
92	East St. Louis, Ill	*1,017,350*		1		2	1		*0.2*	*4,000*		*4,000*
93	Holyoke, Mass	835,812	14		2	28	14	1	51.7	1,052,559	851,919	
94	Brockton, Mass	487,923	20			40	20		*54.8*	1,278,934	1,278,934	
95	Johnstown, Pa	410,080	3			6	3		*8.5*	*150,000*	*150,000*	
97	Oklahoma City, Okla	1,643,345	2			4	2		*3.5*	*73,134*	*73,134*	
98	Bayonne, N. J	526,520	3			3	3		*15.0*	*378,000*	*378,000*	
101	Passaic, N. J	553,730		8		16	8		*33.0*	*525,063*		*525,063*
105	Pawtucket, R. I	1,544,247	20			38	19		61.3	863,600	863,600	

---

[1] Exclusive of roadways in parks.

[2] Not reported.

[3] Car sprinkling is only for the width of the street railway tracks.

WITH WATER BY CITY: 1909—Continued.

with the number assigned to each, see page 85. For a text discussion of this table, see page 60. Figures printed in italics are estimates.]

LENGTH AND AREA REGULARLY SPRINKLED—continued. Area (square yards)—Continued. By cart—Continued. Per employee.	LENGTH AND AREA REGULARLY SPRINKLED—continued. Area (square yards)—Continued. By cart—Continued. Per cart.	LENGTH AND AREA REGULARLY SPRINKLED—continued. Area (square yards)—Continued. By car.	SCHEDULE OF SPRINKLING SEASON. Weeks in sprinkling season.	SCHEDULE OF SPRINKLING SEASON. Frequency of sprinkling.	Quantity of water used (gallons).	EXPENSES OF SPRINKLING WITH WATER. Total.	EXPENSES OF SPRINKLING WITH WATER. Per 1,000 population.	City number.
GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.								
43,755	54,694		35	2 to 4 times a day	(2)	$20,973	$211.21	48
102,041	105,042	[4] *491,040*	22	(2)	(2)	21,259	214.84	49
40,048	40,048	387,200	32	Twice daily	(2)	19,568	201.28	50
25,000	25,000		24	5 times a week	(2)	(2)	(2)	52
52,500	52,500		52	1 to 3 times daily	51,300,000	15,921	171.60	53
22,222	44,444	157,000	26	No schedule	12,290,583	5,655	206.76	54
27,903	27,903	891,860	52	1 to 4 times a day	80,400,000	18,733	215.75	56
414,028			24	Twice daily	*120,000,000*	27,784	318.15	57
33,909	33,909	488,827	27	Twice daily	(2)	18,865	254.10	58
16,667	25,000	*761,400*	(5)	Twice daily	8,312,500	889	10.28	59
83,229	87,853	334,400	28	1 to 4 times daily	(2)	31,626	402.93	60
23,232	23,232	119,600	26	4 times daily	*65,000,000*	21,361	257.05	62
64,846	64,846		30	(2)	35,280,000	7,496	97.71	64
27,762	27,762		26	(2)	*21,000,000*	14,191	192.95	65
27,500	55,000		14	No schedule	(2)	(2)	(2)	66
		70,400	(2)	(2)	(2)	(2)	(2)	67
25,965	27,264		28	No schedule	(2)	16,072	211.36	68
92,510	92,510		52	2 to 4 times daily	28,080,000	2,329	30.66	69
31,848	31,848		26	Twice daily	86,840,000	25,088	406.82	70
40,919	40,919	*227,171*	31	Twice daily	(2)	12,747	179.06	73
50,000	50,000		25	Once a day	(2)	(2)	(2)	74
102,610	102,610	214,391	35	Twice a day	9,063,000	2,063	29.91	75
168,935	168,935		31	No schedule	50,452,800	7,646	140.20	77
65,246	65,246		30	4 times daily	*15,120,000*	5,427	78.94	78
65,322	65,322	116,400	52	1 to 4 times daily	22,320,000	7,482	109.07	79
27,333	41,000		18	No schedule	1,188,500	1,744	26.14	80
25,739	25,739		15	3 to 6 times daily	3,015,292	(2)	(2)	81
22,212	22,212		52	6 times a week	(2)	1,779	27.49	85
32,432	37,422	*157,214*	24	2 to 3 times daily	(2)	23,526	406.88	90
4,000	4,000		24	(2)	(2)	400	7.06	92
60,851	60,851	200,640	48	2 to 4 times a day	41,085,250	14,022	248.71	93
63,947	63,947		24	3 to 8 times daily	22,520,450	11,859	266.57	94
50,000	50,000		35	5 days a week	(2)	(2)	(2)	95
36,567	36,567		52	3 times daily	10,800,000	3,046	57.18	97
126,000	126,000		32	(2)	(2)	3,713	69.85	98
65,633	65,633		32	(2)	(2)	2,825	54.61	101
43,180	45,453		30	(2)	38,440,000	12.019	260.45	105

[4] Includes 1 electric auto sprinkler. [5] Sprinkling by carts is for 20 weeks and that by car for 25 weeks. [6] Reported with the employees of another department.

TABLE 17.—DUST PREVENTION—STREET SPRINKLING[1]

[Cities having no regular sprinkling with water by city are omitted from this table. For a list of the cities arranged alphabetically by states,

City number.	CITY.	Area (square yards) of streets[1] with paved, oil or water bound surface.	NUMBER OF EMPLOYEES—			EQUIPMENT USED.			LENGTH AND AREA REGULARLY SPRINKLED.			
			On cart sprinkling.		On car sprinkling.	Number of horses.	Number of sprinkling carts.	Number of street car sprinklers.	Length (miles).	Area (square yards).		
										Total.	By cart.	
			By city employees.	By contractors.							By city employees.	By contractors.
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.											
109	Springfield, Ill.	1,203,225	2	...	4	4	2	2	*52.4*	*1,160,012*	*828,580*	...
112	Sioux City, Iowa	439,292	2	...	...	4	2	...	5.0	135,000	135,000	...
113	Little Rock, Ark.	586,100	...	...	1	...	...	1	2.0	57,600	...	...
114	Springfield, Ohio	1,821,323	...	...	4	...	...	2	*10.0*	*58,600*	...	...
115	Atlantic City, N. J	1,085,762	21	...	2	21	21	1	26.5	585,625	548,665	...
116	Bay City, Mich	679,543	2	...	...	4	2	...	4.8	121,102	121,102	...
122	Sacramento, Cal	1,529,459	(4)	11	2	22	11	2	117.0	2,717,440	(4)	2,534,400
123	Malden, Mass	*1,302,144*	14	...	...	28	14	...	31.0	721,500	721,500	...
124	Haverhill, Mass	363,651	18	...	...	36	18	...	*28.0*	*429,000*	*429,000*	...
125	Pueblo, Colo	161,025	13	...	...	24	12	...	*17.7*	359,015	359,015	...
126	Salem, Mass	*965,264*	...	7	2	14	7	1	22.1	424,277	...	264,653
127	New Britain, Conn	*401,340*	...	8	3	16	8	1	21.1	371,360	...	242,880
128	Davenport, Iowa	1,179,669	11	...	2	22	11	1	41.0	972,000	540,000	...
131	Augusta, Ga	1,263,589	4	...	2	8	4	1	*30.0*	*388,000*	300,000	...
134	Dubuque, Iowa	1,221,791	7	...	2	12	6	1	20.4	417,800	241,200	...
135	Butte, Mont	93,597	20	...	...	36	18	...	38.0	1,110,400	1,110,400	...
136	Chester, Pa	437,172	...	...	2	...	...	1	17.0	269,280	...	...
138	Montgomery, Ala	437,891	(5)	...	...	(5)	5	...	*2.0*	43,789	43,789	...
139	Woonsocket, R. I	631,947	...	7	...	7	7	...	50.0	880,000	...	880,000
141	Fitchburg, Mass	283,733	12	...	...	24	12	...	28.7	336,747	336,747	...
142	Racine, Wis	447,489	...	14	...	28	14	...	*12.4*	*290,000*	...	*290,000*
148	Auburn, N. Y	*794,322*	...	5	...	8	4	...	7.0	123,904	...	123,904
151	Taunton, Mass	1,256,141	...	...	3	...	...	1	15.0	220,000	...	...
152	Everett, Mass	544,902	14	...	...	26	13	...	31.0	440,480	440,480	...
153	Oshkosh, Wis	958,402	...	12	...	20	10	...	*48.0*	*740,000*	...	*740,000*
154	Chelsea, Mass	*657,850*	6	...	...	10	6	...	14.0	246,600	246,600	...
156	La Crosse, Wis	753,973	13	...	...	26	13	...	40.4	753,972	753,972	...

---

[1] Exclusive of roadways in parks.
[2] Not reported.
[3] Car sprinkling is only for the width of the street railway tracks.

WITH WATER BY CITY: 1909—Continued.

with the number assigned to each, see page 85. For a text discussion of this table, see page 60. Figures printed in italics are estimates.]

LENGTH AND AREA REGULARLY SPRINKLED—continued.			SCHEDULE OF SPRINKLING SEASON.		Quantity of water used (gallons).	EXPENSES OF SPRINKLING WITH WATER.		City number.
Area (square yards)—Continued.			Weeks in sprinkling season.	Frequency of sprinkling.		Total.	Per 1,000 population.	
By cart—Continued.		By car.						
Per employee.	Per cart.							
GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.								
414,290	414,290	*331,432*	34	Part 1 to 3 times daily, other once in 2 days	*3,534,000*	(2)	(2)	109
67,500	67,500	....	34	Part 3 times a week, other 1 to 2 times a day	6,840,000	(2)	(2)	112
....	....	57,600	36	Twice a day	(2)	(2)	(2)	113
....	....	[3] *58,600*	24	Once a day	(2)	(2)	(2)	114
26,127	26,127	[3] 36,960	15	3 times a day	*30,000,000*	$10,633	$238.35	115
60,551	60,551	....	30	3 to 4 times daily	*9,100,000*	1,386	31.15	116
230,400	230,400	183,040	[4] 22	1 to 2 times daily	57,200,000	13,377	308.72	122
51,536	51,536	....	26	Twice a day	43,567,300	11,274	260.49	123
23,833	23,833	....	31	3 times a day	(2)	10,595	261.93	124
27,617	29,918	....	50	2 to 4 times a day	30,000,000	34,249	796.49	125
37,808	37,808	159,624	24	(2)	(2)	6,348	148.91	126
30,360	30,360	128,480	32	3 to 5 times a day	(2)	9,488	223.14	127
49,091	49,091	432,000	34	1 to 2 times daily	*14,820,000*	9,851	231.79	128
75,000	75,000	[3] *88,000*	52	No schedule	(2)	3,383	82.71	131
34,457	40,200	176,600	34	Twice daily	6,650,000	4,024	103.02	134
55,520	61,689	....	32	(2)	(2)	18,178	470.08	135
....	....	269,280	35	Once a day	(2)	(2)	(2)	136
....	8,758	....	32	(2)	(2)	(2)	(2)	138
125,714	125,714	....	30	2 to 4 times daily	19,318,780	6,000	165.27	139
28,062	28,062	....	38	3 times daily	16,416,000	6,999	220.74	141
20,714	20,714	....	33	No schedule	(2)	10,437	282.23	142
24,781	30,976	....	27	1 to 2 times a day	(2)	2,317	92.09	148
....	....	220,000	26	3 times daily	*15,000,000*	4,197	124.61	151
31,463	33,883	....	28	Twice daily	(2)	7,611	232.68	152
61,667	74,000	....	22	2 to 4 times daily	(2)	8,401	257.54	153
41,100	41,100	....	26	2 to 3 times daily	(2)	5,173	197.23	154
57,998	57,998	....	25	Twice daily	(2)	4,410	146.12	156

---

[4] The contract and car sprinkling continues from May 15 to Oct. 15 (22 weeks). If needed before or after that season, the same area is sprinkled by the city, which in 1909 was for about 7 weeks.

[5] Employees and horses reported with those of another department.

TABLE 18.—DUST PREVENTION—USE OF DUST PREVENTIVES OTHER THAN WATER: 1909.

[Only cities reporting dust preventives used in 1909 are shown in this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 62. Figures printed in italics are estimates.]

City number.	CITY AND DUST PREVENTIVE USED.	Area (square yards) of streets with oil or water bound surface.	AREA (SQUARE YARDS) OF ROADWAY TREATED. Total.	AREA (SQUARE YARDS) OF ROADWAY TREATED. In parks.	COST OF TREATMENT.[1] Total.	COST OF TREATMENT.[1] Per 1,000 square yards of surface treated.	Total quantity (gallons) of dust preventive used.	Cost per gallon of dust preventive used.	Length of time (weeks) each application was effective.	Number of applications during year.	Year in which dust preventive was first used.
	Grand total	74,231,230	18,202,234	3,616,096	$332,796	[2] $18.42					
	Group I	29,820,288	10,969,869	2,821,561	215,818	[2] 20.02					
	Group II	27,791,695	3,227,877	707,185	57,813	[2] 18.03					
	Group III	10,279,217	2,425,827	87,350	35,076	[2] 14.66					
	Group IV	6,340,030	1,578,661		24,089	[2] 14.10					

GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.

City number.	CITY AND DUST PREVENTIVE USED.	Area (square yards) of streets with oil or water bound surface.	AREA (SQUARE YARDS) OF ROADWAY TREATED. Total.	AREA (SQUARE YARDS) OF ROADWAY TREATED. In parks.	COST OF TREATMENT.[1] Total.	COST OF TREATMENT.[1] Per 1,000 square yards of surface treated.	Total quantity (gallons) of dust preventive used.	Cost per gallon of dust preventive used.	Length of time (weeks) each application was effective.	Number of applications during year.	Year in which dust preventive was first used.
1	New York, N. Y	11,733,704	1,599,853	174,525	$45,424	$28.39	719,288				
	Tar-bound oil		555,111		9,676	17.43	154,730	$0.055	8	1	1908
	Asphalt road oil		330,927		6,088	18.39	149,294	0.035	8	1	1908
	Residuum oil		220,952		9,135	41.34	201,063	0.033	6	2	1907
	Tarvia		208,223		7,971	38.28	35,000	0.078	16	1	1908
	Asphalt road oil		105,725		4,532	42.87	79,151	0.056	16	1	1908
	Heavy road oil		56,700	174,525	[3] 1,900	33.51	20,000	0.095	52	1	1907
	Emulsifying compound		52,625		3,994	75.90	53,800	0.070	2	8	1907
	Crude petroleum		35,200		500	14.20	10,000	0.035	12	2	1907
	Emulsifying compound		30,000		1,500	50.00	15,000	0.075	4	3	1907
	Glutrin		2,790		56	20.07	500	0.100	8	1	1908
	Glutrin		1,600		72	45.00	750	0.067	16	1	1908
4	St. Louis, Mo	5,844,327	382,000	38,500	13,488	35.31	264,480				
	Medium gravity oil		229,200	38,500	9,668	42.18	203,360	0.025	(4)	2	1907
	Heavy residuum oil		152,800		3,820	25.00	61,120		(4)	1	1907
5	Boston, Mass	6,827,874	5,903,347	778,600	114,899	19.46	1,527,067				
	Texas oil		5,494,836	778,600	98,559	17.94	1,527,067	0.039	1-3	8	1908
	Calcium chloride		408,511		16,340	40.00	(4)	0.060	3	8	1908
6	Baltimore, Md	645,075	262,350		4,542	17.31	45,810				
	Gulf Refining Co. emulsion		237,094		2,983	12.58	40,000	0.073	(4)	14	1907
	Asphaltine		13,611		817	60.03	(4)	(4)	26	1	1907
	Standard road oil		8,700		439	50.46	4,350	0.040	17	1	1907
	Tarvia		2,945		303	103.06	1,460	0.070	52	1	1907
7	Cleveland, Ohio	27,989	254,969	254,969	4,091	16.05	39,557				
	Oil emulsion		160,000	160,000	2,240	14.00	14,200	0.140	4	6	1908
	Tarvia		94,969	94,969	1,851	19.49	25,357	0.055	52	1	1908
8	Pittsburgh, Pa	167,200	26,400		2,216	83.94	60,000				
	Asphaltic emulsion		26,400		[3] 2,216	83.94	60,000	0.037	4	5	1909
9	Detroit, Mich	385,964	599,116	300,000	6,450	10.77	65,000				
	Oil emulsion		599,116	300,000	6,450	10.77	65,000	0.051	2-5	4	1906
10	Buffalo, N. Y	297,937	1,400,910	941,053	8,447	6.03	135,882				
	Standard road oil		560,380	469,872	2,825	5.04	46,675	0.060	13	3	1906
	Standard road oil		400,455	277,915	2,204	5.50	36,209	0.060	13	2	1906
	Standard road oil		365,479	193,266	2,473	6.77	40,548	0.060	13	1	1906
	Standard road oil		29,643		284	9.58	4,450	0.060	13	4	1906
	Tarvia B		44,953		661	14.71	8,000	0.060	52	1	1906
11	San Francisco, Cal	1,093,144	187,733	187,733	(4)		16,000				
	Oil asphaltum base		187,733	187,733	(4)		16,000	0.024	52	1	1900
14	Newark, N. J	405,941	32,837		3,784	115.23	61,777				
	Standard road oil		32,837		3,784	115.23	61,777	0.040	12-16	2	1906
	Sun road oil									4	1906
	Pennsylvania and Delaware road oil									2	1906
16	Washington, D. C	2,391,133	320,354	146,181	12,477	38.95	140,912				
	Asphaltic oil		137,643	146,181	6,194	45.00	*68,821*	(4)	41	1	1908
	Roadbed No. 2		48,391		1,911	39.49	32,205	0.040	41	1	1908
	Target-brand asphalt		43,750		1,071	24.48	7,600	0.125	5	1-6	1908
	Crude oil No. 1		39,800		846	21.26	8,400	0.042	8	9	1908
	Liquid asphalt		24,776		1,741	70.26	16,326	0.065	41	1	1908
	Tarvia B		16,150		540	33.44	5,810	0.065	(5)	1	1908
	Terrocolio		7,700		[3] 88	11.43	550	0.160	3	5	1908
	Asphalt		2,144		86	40.19	1,200	(4)	(5)	1	1908

---

[1] Exclusive of driveways in parks.
[2] Only those cities reporting both area treated and cost are included in this computation.
[3] Cost of oil only.
[4] Not reported.
[5] In use for only a short time.

TABLE 18.—DUST PREVENTION—USE OF DUST PREVENTIVES OTHER THAN WATER: 1909—Continued.

[Only cities reporting dust preventives used in 1909 are shown in this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 62. Figures printed in italics are estimates.]

City number.	CITY AND DUST PREVENTIVE USED.	Area (square yards) of streets with oil or water bound surface.	AREA (SQUARE YARDS) OF ROADWAY TREATED.		COST OF TREATMENT.[1]		Total quantity (gallons) of dust preventive used.	Cost per gallon of dust preventive used.	Length of time (weeks) each application was effective.	Number of applications during year.	Year in which dust preventive was first used.
			Total.	In parks.	Total.	Per 1,000 square yards of surface treated.					
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.										
17	Minneapolis, Minn	259,001	207,179	207,179	$6,865	$33.14	111,892				
	Standard road oil		207,179	207,179	6,865	33.14	111,892	$0.036	52	1	1908
18	Los Angeles, Cal	11,019,823	1,051,000	7,875	20,200	19.22	840,000				
	Residuum asphalt		1,051,000	7,875	20,200	19.22	840,000	0.025	29	1	1909
20	Kansas City, Mo	959,708	672,188	175,919	8,328	12.39	191,329				
	Residuum oil		672,188	175,919	8,328	12.39	191,329	0.020	17	2	1906
21	Indianapolis, Ind	1,489,483	80,749	31,000	1,086	13.45	16,488				
	Asphalt road oil		80,749	31,000	1,086	13.45	16,488	0.042	(2)	1	1908
22	Louisville, Ky	*1,528,031*	110,000	110,000	6,600	60.00	125,000				
	Asphaltoilene		110,000	110,000	6,600	60.00	125,000	0.050	12-16	1	1908
25	Rochester, N. Y	583,763	18,634	11,645	539	28.93	3,520				
	Headley's No. 1		11,645	11,645	247	21.22	1,760	0.140	8	2	1909
	Headley's No. 1		6,989		292	41.77	1,760	0.140	4	4	1909
26	St. Paul, Minn	1,039,902	431,916	115,497	5,623	13.02	111,289				
	Liquid asphalt		431,916	115,497	5,623	13.02	111,289	0.046	*13*	1	1909
28	Portland, Oreg	2,853,052	505,140		5,335	10.56	244,000				
	Crude oil		505,140		5,335	10.56	244,000	0.019	15	1	1908
31	Worcester, Mass	2,977,046	(2)		(2)		16,000				
	Asphaltic oil		(2)		(2)		16,000	0.080		1	1909
32	Atlanta, Ga	1,088,267	20,533		(2)		(2)				
	Coal-tar oil		20,533		(2)		(2)	(2)	13	1	1909
36	Paterson, N. J	1,462,334	8,000		640	80.00	4,000				
	Standard road oil		8,000		640	80.00	4,000	0.038	13	1	1909
37	Omaha, Nebr	63,454	40,000	40,000	510	12.75	12,500				
	Taroleum		40,000	40,000	510	12.75	12,500	0.040	13	2	1906
38	Fall River, Mass	*1,228,900*	18,700		711	38.02	9,084				
	Gas tar		18,700		711	38.02	9,084	0.035	2-8	1	1908
45	Cambridge, Mass	1,220,526	55,768		1,146	20.55	9,164				
	Terracolis		42,500		[3] 379	8.92	2,530	0.150	2	2	1907
	Tarvia		13,268		767	57.80	6,634	0.055	17	2	1907
46	Dayton, Ohio	19,105	8,070	8,070	230	28.50	8,000				
	Asphaltic oil emulsion		8,070	8,070	[3] 230	28.50	8,000	0.029	52	1	1909

---

[1] Exclusive of driveways in parks.

[2] Not reported.

[3] Cost of oil only.

TABLE 18.—DUST PREVENTION—USE OF DUST PREVENTIVES OTHER THAN WATER: 1909—Continued.

[Only cities reporting dust preventives used in 1909 are shown in this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 62. Figures printed in italics are estimates.]

City number.	CITY AND DUST PREVENTIVE USED.	Area (square yards) of streets with oil or water bound surface.	AREA (SQUARE YARDS) OF ROADWAY TREATED.		COST OF TREATMENT.[1]		Total quantity (gallons) of dust preventive used.	Cost per gallon of dust preventive used.	Length of time (weeks) each application was effective.	Number of applications during year.	Year in which dust preventive was first used.
			Total.	In parks.	Total.	Per 1,000 square yards of surface treated.					
GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.											
54	New Bedford, Mass.	940,443	1,398,518		$13,516	$9.66	182,492				
	Dustoline		1,166,544		11,572	9.92	145,381	$0.075	(2)	3	1908
	Standard road oil		215,342		1,652	7.67	30,686	0.050	(2)	3	1908
	Heavy asphaltic oil		16,632		292	17.56	6,425	0.040	(2)	1	1908
56	Dallas, Tex.	837,258	67,350		169	2.51	8,046				
	Crude petroleum		67,350		[3] 169	2.51	8,046	0.020	4	2	1907
58	Lynn, Mass.	392,839	117,333		3,285	28.00	60,739				
	Road-oil emulsion		117,333		3,285	28.00	60,739	0.040	2	26	1909
60	Springfield, Mass.	2,625,708	123,200		3,111	25.25	10,561				
	Calcium chloride		123,200		1,794		(4)	(4)	3	10	1909
	Oil emulsion				[3] 1,053		7,260	0.145	2	14	1909
	Oil emulsion				[3] 264		3,301	0.080	2	21	1909
65	Yonkers, N. Y.	1,292,000	44,001		570	12.95	12,000				
	Standard road oil		44,001		570	12.95	12,000	0.035	17	2	1909
70	Somerville, Mass.	882,933	88,883		5,761	64.85	93,174				
	Tarvia B		70,000	70,400	[3] 3,750	53.57	75,000	0.050	52	1	1906
	Terracolio		7,728		[3] 1,270	164.29	9,075	0.140	3	8	1906
	Liquid asphalt		5,555		[3] 248	44.60	2,760	0.090	3	1	1906
	Asphaltoilene		4,800		[3] 270	56.25	3,000	0.090	3	1	1906
	Asfaloid emulsion oil B		800		[3] 59	73.75	785	0.075	3	1	1906
	Asfaloid emulsion oil		(2)		164		2,554	(2)	3	1	1906
71	Kansas City, Kans.	33,183	31,710		1,003	31.63	34,602				
	Residuum oil		14,760		664	44.99	22,140	0.020	17	2	1909
	Residuum oil		16,950	16,950	339	20.00	12,462	0.020	17	1	1909
74	Elizabeth, N. J.	278,805	205,500		1,683	8.19	34,724				
	Road oil		205,500		1,683		34,724	0.045	9	1	1908
75	Schenectady, N. Y.	34,949	7,492		47	6.28	192				
	Glutrin		7,492		[3] 47	6.28	192	0.240	8	2	1908
77	Manchester, N. H.	483,120	63,360		2,014	3,179	28,927				
	Standard oil		17,600		[3] 458	26.02	10,167	0.045	17-21	1	1907
	Asfaltoil C		15,840		[3] 256	16.16	3,200	0.080	1-2	8	1907
	Terracolio		15,840		[3] 825	52.08	5,000	0.165	1-2	8	1907
	Asfaltoil B		14,080		[3] 475	3,374	10,560	0.045	17-21	1	1907
89	Charleston, S. C.	190,042	(2)		(2)		(2)				
	Standard road oil		(2)		(2)		(2)	(2)	(2)	1	1909
	Tarvia		(2)		(2)		(2)	(2)	(2)	1	1909
93	Holyoke, Mass.	618,640	34,030		(2)						
	Water-gas tar		34,030		(2)		(2)	(2)	26	1	1909
94	Brockton, Mass.	282,065	144,320		2,877	19.93	52,174				
	Emulsifying road oil		144,320		2,877	19.93	52,174	0.050	3	10	1908
105	Pawtucket, R. I.	1,387,232	100,130		1,040	10.39					
	Dustoline		35,185		628	17.85	8,000	0.075	8	1	1909
	Spears' road binder		34,855		142	4.07	750	0.060		1	1909
	Texas		30,090		270	8.97	12,000	(2)	8	3	1909

---

[1] Exclusive of driveways in parks.

[2] Not reported.

[3] Cost of oil only.

[4] 276,000 pounds at 6½ cents per pound.

TABLE 18.—DUST PREVENTION—USE OF DUST PREVENTIVES OTHER THAN WATER: 1909—Continued.

[Only cities reporting dust preventives used in 1909 are shown in this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table see page 62. Figures printed in italics are estimates.]

City number.	CITY AND DUST PREVENTIVE USED.	Area (square yards) of streets with oil or water bound surface.	AREA (SQUARE YARDS) OF ROADWAY TREATED.		COST OF TREATMENT.[1]		Total quantity (gallons) of dust preventive used.	Cost per gallon of dust preventive used.	Length of time (weeks) each application was effective.	Number of applications during year.	Year in which dust preventive was first used.
			Total.	In parks.	Total.	Per 1,000 square yards of surface treated.					
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.										
106	Saginaw, Mich.	371,824	39,402	...	$1,618	$41.07	12,925	...	...	...	...
	Gas tar	...	22,452	...	1,453	64.72	1,125	$0.050	(2)	1	1907
	Liquid asphalt	...		...			500	0.065	(2)	1	1907
	Tarvia	...		...			5,300	0.075	(2)	1	1907
	Road oil	...	16,950	...	165	9.73	6,000	0.029	(2)	1	1907
124	Haverhill, Mass.	230,905	(3)	...	668	...	...	...	...	...	...
	Dustoline	...	(3)	...	668	...	...	0.050	*17*	1	(3)
	Standard oil emulsion	...	(3)	...						1	(3)
	Spears' road binder	...	(3)	...						1	(3)
	Tarvia B	...	(3)	...						1	(3)
133	Newton, Mass.	1,813,654	1,400,000	...	18,052	12.89	233,930	...	...	...	...
	Headley's dust preventive, No. 1	...	1,186,955	...	18,052	...	61,000	0.125	3-5	5	1906
	Spears' road binder			...			27,600	0.100	3-5	5	1906
	Standard emulsifying road oil			...			7,670	0.050	3-5	5	1906
	Asfalt emulsion oil C			...			11,882	0.080	3-5	2	1906
	Liquid asphalt	...	92,500	...			74,000	(3)	(4)	1	1906
	Tarvia B	...	70,000	...			37,128	0.050	15-16	2	1906
	Dustoline	...	40,000	...			6,650	0.073	15-16	2	1906
	Asphaltoilene	...	10,545	...			8,000	0.072	(4)	1	1906
139	Woonsocket, R. I.	591,125	3,500	...	125	35.71	1,000	...	...	...	...
	Tarvia B	...	3,500	...	125	35.71	1,000	0.060	34	1	1907
141	Fitchburg, Mass.	147,448	(3)	...	1,164	...	5,850	...	...	...	...
	Standard emulsifying road oil	...	(3)	...	1,164	...	5,850	0.150	2	3	1909
145	Knoxville, Tenn.	1,015,889	12,689	...	395	31.13	6,500	...	...	...	...
	Crude oil	...	12,689	...	395	31.13	6,500	0.053	17	1	1909
148	Auburn, N. Y.	624,213	72,000	...	840	11.67	12,000	...	...	...	...
	Dustoline	...	72,000	...	[5] 840	11.67	12,000	0.070	16-24	1	1909
154	Chelsea, Mass.	544,972	51,070	...	1,227	24.03	7,470	...	...	...	...
	Emulsion	...	51,070	...	1,227	24.03	7,470	0.140	2-5	8	1909

[1] Exclusive of driveways in parks.
[2] Applied in 1908 and still serviceable.
[3] Not reported.
[4] Considered permanent.
[5] Cost of oil only.

TABLE 19.—HIGHWAYS—MILEAGE AND PER CENT DISTRIBUTION OF THE LENGTH OF STREETS[1] AND ALLEYS, CLASSIFIED AS WITH DURABLE AND NONDURABLE PAVEMENTS AND AS UNPAVED: 1909.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 64. Figures printed in italics are estimates.]

City number.	CITY.	Total length of streets and alleys (miles).	Total length of streets (miles).	STREETS WITH DURABLE PAVEMENTS.		STREETS WITH NONDURABLE PAVEMENTS.		STREETS UNPAVED.		Total length of alleys (miles).	ALLEYS WITH DURABLE PAVEMENTS.		ALLEYS WITH NONDURABLE PAVEMENTS.		ALLEYS UNPAVED.	
				Length (miles).	Per cent of total street mileage.	Length (miles).	Per cent of total street mileage.	Length (miles).	Per cent of total street mileage.		Length (miles).	Per cent of total alley mileage.	Length (miles).	Per cent of total alley mileage.	Length (miles).	Per cent of total alley mileage.
	Grand total	[2]53,313.4	[2]45,984.1	11,820.1	25.7	9,073.1	19.7	25,071.5	54.6	7,329.3	741.3	9.9	209.8	2.7	6,378.2	87.4
	Group I	19,558.1	16,696.2	6,881.7	41.2	3,273.9	19.6	6,540.6	39.2	2,861.9	470.3	16.4	71.8	2.5	2,319.8	81.1
	Group II	14,877.5	12,700.5	2,296.4	17.5	2,723.0	21.4	7,681.1	61.1	2,177.0	181.1	8.3	77.8	3.6	1,918.1	88.1
	Group III	11,221.2	9,850.4	1,809.4	17.2	1,729.8	17.7	6,311.2	65.0	1,370.8	50.3	3.2	44.9	3.3	1,275.6	93.5
	Group IV	[2]7,656.6	[2]6,737.0	832.6	12.8	1,346.4	19.6	4,538.6	67.5	919.6	39.6	3.1	15.3	0.2	864.7	96.7
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.															
1	New York, N. Y	3,477.6	3,447.6	1,269.8	36.8	843.1	24.5	1,334.7	38.7	......	......	......	......	......	......	......
2	Chicago, Ill	4,315.6	2,880.7	966.5	33.6	576.3	20.0	1,337.9	46.4	1,434.9	60.2	4.2	71.7	4.9	1,303.0	90.8
3	Philadelphia, Pa	[3]1,836.4	1,836.4	1,070.4	58.3	295.0	16.1	471.0	25.6	([4])	([4])	......	([4])	......	([4])	......
4	St. Louis, Mo	1,260.1	907.9	294.1	32.4	276.7	30.5	337.1	37.1	352.2	172.9	49.1	......	......	179.3	50.9
5	Boston, Mass	518.7	513.9	132.9	25.9	376.9	73.3	4.1	0.8	4.8	4.8	100.0	......	......	......	......
6	Baltimore, Md	*551.2*	*435.0*	356.6	82.0	52.2	12.0	*26.2*	6.0	116.2	110.5	95.1	......	......	5.7	4.9
7	Cleveland, Ohio	683.7	683.7	383.9	56.2	1.5	0.2	298.3	43.6	......	......	......	......	......	......	......
8	Pittsburgh, Pa	1,032.9	[5]1,032.9	498.3	48.2	10.6	1.0	524.0	50.7	([5])	......	......	......	......	......	......
9	Detroit, Mich	1,138.6	681.6	370.9	54.4	16.8	2.5	293.9	43.1	457.0	22.6	4.9	......	......	434.4	95.1
10	Buffalo, N. Y	668.8	661.1	345.6	52.3	13.8	2.1	301.7	45.6	7.7	3.4	44.2	......	......	4.3	55.8
11	San Francisco, Cal	*805.0*	800.0	268.0	33.5	46.0	5.8	486.0	60.8	*5.0*	*2.9*	58.0	......	......	*2.1*	42.0
12	Cincinnati, Ohio	762.9	[5]762.9	262.9	34.5	234.0	30.7	266.0	34.9	([5])	......	......	......	......	......	......
13	Milwaukee, Wis	*1,020.2*	538.2	80.5	15.0	273.5	50.8	184.2	34.2	*482.0*	92.0	19.0	......	......	*390.0*	81.0
14	Newark, N. J	288.4	286.3	171.3	59.8	29.8	10.4	85.2	29.7	2.1	1.0	47.6	0.1	4.8	1.0	47.6
15	New Orleans, La	[3]774.4	774.4	203.5	26.3	70.9	9.2	500.0	64.6	([4])	([4])	......	([4])	......	([4])	......
16	Washington, D. C	[3]453.6	453.6	206.5	45.5	156.8	34.6	90.3	19.9	([4])	([4])	......	......	......	([4])	......
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.															
17	Minneapolis, Minn	928.9	599.1	120.7	20.1	16.3	2.7	462.1	77.1	*329.8*	4.5	1.4	......	......	325.3	98.6
18	Los Angeles, Cal	1,069.3	1,043.5	59.8	5.7	469.1	45.0	514.6	49.3	25.8	2.8	10.9	......	......	23.0	89.1
19	Jersey City, N. J	208.5	[5]208.5	108.7	52.1	23.5	11.3	76.3	36.6	([5])	......	......	......	......	......	......
20	Kansas City, Mo	*515.4*	452.8	236.3	52.2	39.5	8.7	177.0	39.1	*62.6*	22.4	35.8	0.2	0.3	*40.0*	63.9
21	Indianapolis, Ind	476.5	[5]476.5	166.4	34.9	119.6	25.1	190.5	40.0	([5])	......	......	......	......	......	......
22	Louisville, Ky	[6]*453.2*	[6]286.2	122.4	......	72.4	......	[6]91.4	......	*167.0*	62.3	37.3	18.9	11.3	*85.8*	51.4
23	Seattle, Wash	1,516.8	[5]1,516.8	181.3	12.0	1.4	0.1	1,334.1	88.0	([5])	......	......	......	......	......	......
24	Providence, R. I	257.1	[5]257.1	46.0	17.9	200.6	78.0	10.5	4.1	([5])	......	......	......	......	......	......
25	Rochester, N. Y	341.5	340.1	144.4	42.5	43.0	12.6	152.7	44.9	1.4	1.4	100.0	......	......	......	......
26	St. Paul, Minn	1,055.6	792.1	51.2	6.4	59.6	7.5	681.3	86.0	*263.5*	3.5	1.3	0.1	([7])	259.9	98.5
27	Denver, Colo	*1,629.2*	1,222.0	24.7	2.0	103.7	8.5	1,093.6	89.5	*407.2*	13.0	3.2	4.2	1.0	*390.0*	95.8
28	Portland, Oreg	[3]839.0	839.0	73.2	8.7	187.8	22.4	578.0	68.9	([4])	([4])	......	([4])	......	([4])	......
29	Columbus, Ohio	487.1	[5]487.1	181.7	37.3	8.1	1.7	297.3	61.0	([5])	......	......	......	......	......	......
30	Toledo, Ohio	571.9	390.5	167.6	42.9	14.3	3.7	208.6	53.4	181.4	2.8	1.5	......	......	178.6	98.5
31	Worcester, Mass	211.2	211.2	23.8	11.3	187.4	88.7	......	......	......	......	......	......	......	......	......
32	Atlanta, Ga	[3]237.0	237.0	62.9	26.5	53.0	22.4	121.1	51.1	([4])	([4])	......	([4])	......	([4])	......
33	Syracuse, N. Y	261.9	260.0	68.1	26.2	0.6	0.2	191.3	73.5	1.9	0.2	10.5	......	......	1.7	89.5
34	New Haven, Conn	193.9	[5]193.9	16.6	8.6	66.3	34.2	111.0	57.2	([5])	......	......	......	......	......	......
35	Scranton, Pa	153.0	[5]153.0	34.0	22.2	......	......	119.0	77.8	([5])	......	......	......	......	......	......
36	Paterson, N. J	[6]167.0	166.7	23.7	14.2	69.2	41.5	*73.8*	44.2	[6]0.3	0.3	......	......	......	([4])	......
37	Omaha, Nebr	719.4	539.4	113.4	21.0	4.5	0.8	421.5	78.1	180.0	5.0	2.8	......	......	175.0	97.2
38	Fall River, Mass	*144.4*	*144.4*	15.6	10.8	*80.3*	55.6	48.5	33.6	......	......	......	......	......	......	......
39	Memphis, Tenn	*367.0*	*253.9*	57.0	22.5	93.9	37.0	*103.0*	40.5	113.1	3.1	2.7	......	......	110.0	97.3
40	Richmond, Va	162.9	116.4	44.0	37.8	72.4	62.2	......	......	46.5	16.5	35.5	......	......	30.0	64.5
41	Oakland, Cal	277.0	276.0	13.1	4.7	216.2	78.3	46.7	16.9	1.0	......	......	......	......	1.0	100.0
42	Gand Rapids, Mich	[3]299.2	299.2	32.4	10.8	155.3	51.9	111.5	37.3	([4])	([4])	......	([4])	......	([4])	......
43	Nashville, Tenn	460.1	322.2	16.0	5.0	163.6	50.8	142.6	44.3	137.9	0.4	0.3	54.4	39.4	83.1	60.2
44	Lowell, Mass	206.6	203.7	21.8	10.7	115.8	56.8	66.1	32.4	2.9	0.2	6.9	......	......	2.7	93.1
45	Cambridge, Mass	102.3	102.3	17.6	17.2	84.7	82.8	......	......	......	......	......	......	......	......	......
46	Dayton, Ohio	564.6	309.9	52.0	16.7	0.9	0.3	257.0	82.9	254.7	42.7	16.8	......	......	212.0	83.2

---

[1] Exclusive of roadways in parks.
[2] Length (miles) of paved streets in Montgomery, Ala., reported in the totals but not in the subdivisions.
[3] Streets only.
[4] Not reported.
[5] Alleys included with streets.
[6] Incomplete.
[7] Less than one-tenth of 1 per cent.

Table 19.—HIGHWAYS—MILEAGE AND PER CENT DISTRIBUTION OF THE LENGTH OF STREETS [1] AND ALLEYS, CLASSIFIED AS WITH DURABLE AND NONDURABLE PAVEMENTS AND AS UNPAVED: 1909—Continued.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 64. Figures printed in italics are estimates.]

City number.	CITY.	Total length of streets and alleys (miles).	Total length of streets (miles).	STREETS WITH DURABLE PAVEMENTS.		STREETS WITH NONDURABLE PAVEMENTS.		STREETS UNPAVED.		Total length of alleys (miles).	ALLEYS WITH DURABLE PAVEMENTS.		ALLEYS WITH NONDURABLE PAVEMENTS.		ALLEYS UNPAVED.	
				Length (miles).	Per cent of total street mileage.	Length (miles).	Per cent of total street mileage.	Length (miles).	Per cent of total street mileage.		Length (miles).	Per cent of total alley mileage.	Length (miles).	Per cent of total alley mileage.	Length (miles).	Per cent of total alley mileage.
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.															
47	Albany, N. Y	134.3	133.9	83.5	62.4	6.4	4.8	44.0	32.9	0.4	0.4	100.0	......	......	......	......
48	Bridgeport, Conn	*186.7*	186.7	8.0	4.3	*72.7*	39.0	106.0	56.8	......	......	......	......	......	......	......
49	Spokane, Wash	*920.6*	*920.2*	12.1	1.3	1.1	0.1	*907.0*	98.6	0.4	0.4	100.0	......	......	......	......
50	Hartford, Conn	*114.6*	*114.6*	9.6	8.4	*95.0*	82.9	10.0	8.7	......	......	......	......	......	......	......
51	Reading, Pa	138.0	[2] 138.0	27.2	19.7	51.8	37.5	59.0	42.8	(2)	......	......	......	......	......	......
52	Trenton, N. J	123.4	[2] 123.4	28.5	23.1	10.9	8.8	84.0	68.1	(2)	......	......	......	......	......	......
53	San Antonio, Tex	*692.9*	*572.9*	10.9	1.9	*154.2*	26.9	407.8	71.2	*120.0*	......	......	......	......	*120.0*	100.0
54	New Bedford, Mass	156.5	156.5	22.8	14.6	75.0	47.9	58.7	37.5	......	......	......	......	......	......	......
55	Camden, N. J	*220.0*	*220.0*	66.0	30.0	4.0	1.8	*150.0*	68.2	......	......	......	......	......	......	......
56	Dallas, Tex	*525.1*	*325.1*	20.3	6.2	47.3	14.5	*257.5*	79.2	*200.0*	......	......	......	......	*200.0*	100.0
57	Salt Lake City, Utah	376.1	374.9	20.6	5.5	3.3	0.9	351.0	93.6	1.2	1.2	100.0	......	......	......	......
58	Lynn, Mass	[3] 25.9	[3] 25.9	7.6	......	18.3	......	(4)	......	......	......	......	......	......	......	......
59	Wilmington, Del	93.3	93.3	43.2	46.3	19.7	21.1	30.4	32.6	......	......	......	......	......	......	......
60	Springfield, Mass	172.5	172.5	10.9	6.3	146.6	85.0	15.0	8.7	......	......	......	......	......	......	......
61	Des Moines, Iowa	*594.4*	437.0	71.3	16.3	0.7	0.2	365.0	83.5	*157.4*	7.4	4.7	......	......	*150.0*	95.3
62	Lawrence, Mass	115.4	114.4	7.4	6.5	26.0	22.7	81.0	70.8	1.0	0.2	20.0	......	......	0.8	80.0
63	St. Joseph, Mo	285.7	191.1	47.6	24.9	28.2	14.8	115.3	60.3	94.6	5.2	5.5	......	......	89.4	94.5
64	Troy, N. Y	[3] *100.0*	[3] *100.0*	49.6	......	3.0	......	[3] *47.4*	......	(4)	(4)	......	(4)	......	(4)	......
65	Yonkers, N. Y	122.2	122.2	10.5	8.6	88.1	72.1	23.6	19.3	......	......	......	......	......	......	......
66	Tacoma, Wash	201.4	[2] 201.4	49.6	24.6	0.3	0.1	151.5	75.2	(2)	......	......	......	......	......	......
67	Youngstown, Ohio	[5] 150.0	150.0	45.1	30.0	0.9	0.6	104.0	69.3	(4)	(4)	......	(4)	......	(4)	......
68	Duluth, Minn	*433.2*	232.0	26.4	11.4	87.2	37.6	118.4	51.0	*201.2*	1 2	0.6	......	......	*200.0*	99.4
69	Houston, Tex	185.1	180.1	23.6	13.1	51.7	28.7	104.8	58.2	5.0	......	......	......	......	5.0	100.0
70	Somerville, Mass	101.0	101.0	8.3	8.2	72.1	71.4	20.6	20.4	......	......	......	......	......	......	......
71	Kansas City, Kans	*278.5*	228.0	65.1	28.6	1.9	0.8	161.0	70.6	*50.5*	2.5	49.5	......	......	*48.0*	50.5
72	Utica, N. Y	[5] 124.0	124.0	65.8	53.1	0.9	0.7	57.3	46.2	(4)	(4)	......	(4)	......	(4)	......
73	Waterbury, Conn	[3] *146.1*	[3][2] *146.1*	9.1	......	*7.0*	......	[3] *130.0*	......	(2)	......	......	......	......	......	......
74	Elizabeth, N. J	98.5	98.5	31.2	31.7	19.1	19.4	48.2	48.9	......	......	......	......	......	......	......
75	Schenectady, N. Y	[3] 49.9	[3] 49.9	47.9	......	2.0	......	(4)	......	(4)	(4)	......	(4)	......	(4)	......
76	Hoboken, N. J	31.3	31.3	21.4	68.4	0.7	2.2	9.2	29.4	......	......	......	......	......	......	......
77	Manchester, N. H	*196.5*	*196.5*	6.2	3.2	*30.5*	15.5	159.8	81.3	......	......	......	......	......	......	......
78	Evansville, Ind	[5] *119.9*	*119.9*	39.7	33.1	8.2	6.8	*72.0*	60.1	(4)	(4)	......	(4)	......	(4)	......
79	Birmingham, Ala	[3] 184.8	182.8	18.2	10.0	65.0	35.6	99.6	54.5	[3] 2.0	2.0	......	......	......	(4)	......
80	Akron, Ohio	[3] 176.7	175.7	49.2	28.0	6.8	3.9	119.7	68.1	[3] 1.0	1.0	......	......	......	(4)	......
81	Norfolk, Va	*124.0*	116.9	46.0	39.3	13.4	11.5	57.5	49.2	*7.1*	3.1	43.7	......	......	*4.0*	56.3
82	Fort Worth, Tex	456.4	356.9	6.9	1.9	75.0	21.0	275.0	77.1	99.5	......	......	......	......	99.5	100.8
83	Wilkes-Barre, Pa	[3] 43.9	[3] 27.9	27.8	......	0.1	......	(4)	......	16.0	1.0	6.2	......	......	15.0	93.0
84	Erie, Pa	110.1	110.1	41.1	37.3	......	......	69.0	62.7	......	......	......	......	......	......	......
85	Savannah, Ga	[5] 130.0	130.0	40.5	31.2	4.5	3.5	85.0	65.4	(4)	(4)	......	(4)	......	(4)	......
86	Peoria, Ill	225.2	154.6	57.8	37.4	1.0	0.6	95.8	62.0	70.6	3.2	4.5	44.9	63.6	22.5	31.9
87	Harrisburg, Pa	[5] 101.7	101.7	41.7	41.0	10.0	9.8	50.0	49.2	(4)	(4)	......	(4)	......	(4)	......
88	Fort Wayne, Ind	[3] *247.9*	*244.6*	44.6	18.2	......	......	*200.0*	81.8	[3] 3.3	3.3	......	......	......	(4)	......
89	Charleston, S. C	68.5	[2] 68.5	25.2	36.8	12.2	17.8	31.1	45.4	(2)	......	......	......	......	......	......
90	Portland, Me	[5] *147.8*	*147.8*	34.3	23.2	*85.1*	57.6	*28.4*	19.2	(4)	(4)	......	(4)	......	(4)	......
91	Terre Haute, Ind	256.0	170.7	24.1	14.1	58.0	34.0	88.6	51.9	85.3	1.5	1.8	......	......	83.8	98.2
92	East St. Louis, Ill	[3] *48.2*	[3] *48.2*	*45.2*	......	*3.0*	......	(4)	......	......	......	......	......	......	......	......
93	Holyoke, Mass	110.0	99.1	11.2	11.3	35.2	35.5	52.7	53.2	10.9	1.3	11.9	......	......	9.6	88.1
94	Brockton, Mass	113.5	113.5	11.8	10.4	20.5	18.1	81.2	71.5	......	......	......	......	......	......	......
95	Johnstown, Pa	119.7	70.8	23.0	32.5	......	......	47.8	67.5	48.9	4.0	8.2	......	......	44.9	91.8
96	Jacksonville, Fla	[5] 135.0	135.0	35.3	26.1	23.0	17.0	76.7	56.8	(4)	(4)	......	(4)	......	(4)	......
97	Oklahoma City, Okla	*475.3*	*300.2*	78.4	26.1	0.8	0.3	221.0	73.6	*175.1*	2.1	1.2	......	......	*173.0*	98.8
98	Bayonne, N. J	47.8	47.8	9.3	19.5	11.0	23.0	27.5	57.5	......	......	......	......	......	......	......
99	Covington, Ky	89.4	70.0	17.2	24.6	38.8	55.4	14.0	20.0	19.4	9.3	47.9	......	......	10.1	52.1
100	South Bend, Ind	156.6	[2] 156.6	49.5	31.6	2.3	1.5	104.8	66.9	(2)	......	......	......	......	......	......
101	Passaic, N. J	[3] 60.8	[3][2] 60.8	3.3	......	31.5	......	[3] 26.0	......	(2)	......	......	......	......	......	......
102	Altoona, Pa	*68.4*	[2] *68.4*	28.2	41.2	0.6	0.9	*39.6*	57.9	(2)	......	......	......	......	......	......
103	Mobile, Ala	[5] 103.9	103.9	18.9	18.2	4.0	3.8	81.0	78.0	(4)	(4)	......	(4)	......	(4)	......
104	Allentown, Pa	[5] *63.3*	*63.3*	14.5	22.9	8.8	13.9	*40.0*	63.2	(4)	(4)	......	(4)	......	(4)	......
105	Pawtucket, R. I	143.3	143.3	9.2	6.4	84.4	58.9	49.7	34.7	......	......	......	......	......	......	......

---

[1] Exclusive of roadways in parks. [2] Alleys included with streets. [3] Incomplete. [4] Not reported. [5] Streets only.

TABLE 19.—HIGHWAYS—MILEAGE AND PER CENT DISTRIBUTION OF THE LENGTH OF STREETS[1] AND ALLEYS, CLASSIFIED AS WITH DURABLE AND NONDURABLE PAVEMENTS AND AS UNPAVED: 1909—Continued.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 64. Figures printed in italics are estimates.]

City number.	CITY.	Total length of streets and alleys (miles).	Total length of streets (miles).	STREETS WITH DURABLE PAVEMENTS.		STREETS WITH NONDURABLE PAVEMENTS.		STREETS UNPAVED.		Total length of alleys (miles).	ALLEYS WITH DURABLE PAVEMENTS.		ALLEYS WITH NONDURABLE PAVEMENTS.		ALLEYS UNPAVED.	
				Length (miles).	Per cent of total street mileage.	Length (miles).	Per cent of total street mileage.	Length (miles).	Per cent of total street mileage.		Length (miles).	Per cent of total alley mileage.	Length (miles).	Per cent of total alley mileage.	Length (miles).	Per cent of total alley mileage.
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.															
106	Saginaw, Mich	*207.4*	[2] *207.4*	43.5	21.0	22.2	10.7	*141.7*	*68.3*	(2)	......	......	......	......	......	......
107	Canton, Ohio	[3] *183.3*	*183.3*	23.9	13.0	......	......	*159.4*	87.0	(4)	(4)	......	(4)	......	(4)	......
108	Wichita, Kans	349.1	[2] 349.1	18.6	5.3	0.5	0.1	330.0	94.5	(2)	......	......	......	......	......	......
109	Springfield, Ill	[6] 164.1	161.3	50.9	31.6	1.5	0.9	108.9	67.5	[6] 2.8	2.8	......	......	......	(4)	......
110	Binghamton, N. Y	*92.5*	*91.7*	12.6	13.7	5.0	5.5	*74.1*	80.8	0.8	0.8	100.0	......	......	......	......
111	Lancaster, Pa	77.4	[2] 77.4	8.9	11.5	40.5	52.3	28.0	36.2	(2)	......	......	......	......	......	......
112	Sioux City, Iowa	*933.1*	630.9	16.5	2.6	......	......	614.4	97.4	*302.2*	2.2	0.7	......	......	*300.0*	99.3
113	Little Rock, Ark	*243.5*	*192.9*	15.9	8.2	15.0	7.8	*162.0*	83.9	*50.6*	0.6	1.2	......	......	*50.0*	98.8
114	Springfield, Ohio	211.4	125.5	12.9	10.3	65.6	52.3	47.0	37.4	85.9	1.9	2.2	......	......	84.0	97.8
115	Atlantic City, N. J	*88.0*	*88.0*	16.9	19.2	41.1	46.7	*30.0*	34.1	......	......	......	......	......	......	......
116	Bay City, Mich	201.2	184.5	35.5	19.2	3.7	2.0	145.3	78.8	16.7	1.0	6.0	......	......	15.7	94.0
117	Rockford, Ill	[5] 157.1	156.9	4.0	2.5	56.9	36.3	96.0	61.2	[6] 0.2	0.2	......	......	......	(4)	......
118	York, Pa	75.0	60.0	5.5	9.1	25.0	41.7	29.5	49.2	15.0	......	......	......	......	15.0	100.0
119	Lincoln, Nebr	*246.5*	197.1	35.1	17.8	......	......	162.0	82.2	*49.4*	2.4	4.9	......	......	*47.0*	96.1
120	Chattanooga, Tenn	[5] 110.0	[6] 110.0	13.3	......	21.7	......	[6] 75.0	......	(4)	(4)	......	(4)	......	(4)	......
121	Topeka, Kans	240.2	[2] 240.2	50.2	20.9	2.0	0.8	188.0	78.3	(2)	......	......	......	......	......	......
122	Sacramento, Cal	131.5	94.6	9.6	10.1	45.1	47.7	39.9	42.2	36.9	1.6	4.3	2.1	5.7	33.2	90.0
123	Malden, Mass	*62.6*	*62.6*	1.1	1.8	*60.3*	96.3	*1.2*	1.9	......	......	......	......	......	......	......
124	Haverhill, Mass	*135.0*	*135.0*	8.0	5.9	16.8	12.4	*110.2*	81.6	......	......	......	......	......	......	......
125	Pueblo, Colo	*399.1*	239.0	4.4	1.8	1.1	0.5	233.5	97.7	*160.1*	0.1	0.1	......	......	*160.0*	99.9
126	Salem, Mass	*62.0*	*62.0*	*5.3*	8.5	*48.1*	77.6	8.6	13.9	......	......	......	......	......	......	......
127	New Britain, Conn	*77.8*	*77.8*	0.2	0.3	*22.6*	29.0	*55.0*	70.7	......	......	......	......	......	......	......
128	Davenport, Iowa	[6] 143.5	140.1	49.4	35.3	0.7	0.5	90.0	64.2	[6] 3.4	3.4	......	......	......	(4)	......
129	McKeesport, Pa	[3] 80.1	80.1	31.1	38.8	0.6	0.7	48.4	60.4	(4)	(4)	......	(4)	......	(4)	......
130	Wheeling, W. Va	68.4	46.3	29.4	63.5	3.9	8.4	13.0	28.1	22.1	5.3	24.0	......	......	16.8	76.0
131	Augusta, Ga	91.4	[2] 91.4	6.0	6.6	54.8	60.0	30.6	33.4	(2)	......	......	......	......	......	......
132	Superior, Wis	[5] 127.1	125.1	32.6	26.1	17.2	13.7	75.3	60.2	[6] 2.0	2.0	......	......	......	(4)	......
133	Newton, Mass	203.9	203.9	25.0	12.3	116.9	57.3	62.0	30.4	......	......	......	......	......	......	......
134	Dubuque, Iowa	[6] 111.0	99.9	8.4	8.4	72.2	72.3	19.3	19.3	[6] 11.1	0.2	......	10.9	......	(4)	......
135	Butte, Mont	[5] 93.7	93.3	3.3	3.5	......	......	90.0	96.5	[6] 0.4	0.4	......	......	......	(4)	......
136	Chester, Pa	78.4	78.4	18.6	23.7	6.4	8.2	53.4	68.1	......	......	......	......	......	......	......
137	Kalamazoo, Mich	127.8	120.1	15.8	13.2	0.3	0.2	104.0	86.6	7.7	0.6	7.8	......	......	7.1	92.2
138	Montgomery, Ala	[3] 169.6	[6] 169.6	(4)	......	(4)	......	150.2	88.6	(4)	(4)	......	(4)	......	(4)	......
139	Woonsocket, R. I	80.4	80.4	2.3	2.9	45.8	57.0	32.3	40.2	......	......	......	......	......	......	......
140	Galveston, Tex	164.5	124.5	7.5	6.0	32.0	25.7	85.0	68.3	40.0	0.2	0.5	......	......	39.8	99.5
141	Fitchburg, Mass	[5] 135.1	[5] 135.1	7.2	......	14.1	......	[5] 113.8	......	......	......	......	......	......	......	......
142	Racine, Wis	*80.3*	*79.9*	20.2	25.3	2.7	3.4	*57.0*	71.3	0.4	0.4	100.0	......	......	......	......
143	Elmira, N. Y	*123.3*	*120.3*	11.1	9.2	47.0	39.1	*62.2*	51.7	*3.0*	......	......	......	......	3.0	100.0
144	Quincy, Ill	*118.3*	94.3	27.6	29.3	12.7	13.5	54.0	57.2	*24.0*	1.1	4.5	......	......	*22.9*	96.5
145	Knoxville, Tenn	[5] *134.5*	*133.0*	20.5	15.4	57.5	43.2	*55.0*	41.4	[6] 1.5	1.5	......	......	......	(4)	......
146	New Castle, Pa	196.9	142.9	22.4	15.7	0.5	0.3	120.0	84.0	54.0	......	......	......	......	54.0	100.0
147	Macon, Ga	61.4	[2] 61.4	5.9	9.6	......	......	55.5	90.4	(2)	......	......	......	......	......	......
148	Auburn, N. Y	*74.9*	*74.9*	6.9	9.2	*38.0*	50.7	*30.0*	40.1	......	......	......	......	......	......	......
149	West Hoboken, N. J	22.5	22.5	15.0	66.7	2.9	12.9	4.6	20.4	......	......	......	......	......	......	......
150	Joliet, Ill	73.3	72.4	11.5	15.9	20.1	27.8	40.8	56.3	0.9	0.9	100.0	......	......	......	......
151	Taunton, Mass	152.5	152.5	7.1	4.7	89.1	58.4	56.3	36.9	......	......	......	......	......	......	......
152	Everett, Mass	42.4	42.4	1.8	4.2	37.0	87.3	3.6	8.5	......	......	......	......	......	......	......
153	Oshkosh, Wis	[5] *82.9*	[5] *76.3*	15.6	......	35.7	......	[5] *25.0*	......	*6.6*	*0.1*	1.5	......	......	*6.5*	98.5
154	Chelsea, Mass	*42.3*	*42.3*	*6.4*	15.1	*30.9*	73.0	5.0	11.8	......	......	......	......	......	......	......
155	Joplin, Mo	[5] 69.4	[6] 65.6	4.7	......	60.9	......	(4)	......	[6] 3.8	1.5	......	2.3	......	(4)	......
156	La Crosse, Wis	*120.1*	110.6	8.0	7.2	32.4	29.3	70.2	63.4	*9.5*	1.0	10.5	......	......	*8.5*	89.5
157	Newport, Ky	38.3	29.7	7.9	26.6	19.4	65.3	2.4	8.1	8.6	7.4	86.0	......	......	1.2	14.0
158	South Omaha, Nebr	100.6	[2] 100.6	10.6	10.5	......	......	90.0	89.5	(2)	......	......	......	......	......	......

---

[1] Exclusive of roadways in parks.
[2] Alleys included with streets.
[3] Streets only.
[4] Not reported.
[5] Incomplete.
[6] Length (miles) of paved streets reported in the totals but not in the subdivisions.

TABLE 20.—HIGHWAYS—LENGTH, AREA, AND AVERAGE WIDTH OF PAVED STREETS,[1] CLASSIFIED AS WITH DURABLE AND NONDURABLE PAVEMENTS, WITH PER CENT OF THE TOTAL LENGTH AND AREA IN EACH CLASS: 1909.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 65. Figures printed in italics are estimates.]

City number.	CITY.	ALL PAVEMENTS.			DURABLE PAVEMENTS.					NONDURABLE PAVEMENTS.				
		Length (miles).	Area (square yards).	Average width (feet).	Length.		Area.		Average width (feet).	Length.		Area.		Average width (feet).
					Miles.	Per cent of total.	Square yards.	Per cent of total.		Miles.	Per cent of total.	Square yards.	Per cent of total.	
	Grand total	[2] 20,912.6	387,471,590	31.5	11,820.1	56.5	226,932,915	58.6	32.7	9,073.1	43.5	160,538,675	41.4	30.3
	Group I	10,155.6	181,702,673	30.6	6,881.7	67.8	128,370,193	70.6	31.8	3,273.9	32.2	53,332,480	29.4	27.9
	Group II	5,019.4	96,015,590	32.7	2,296.4	45.8	44,780,603	46.9	33.6	2,723.0	54.2	51,234,987	53.1	32.1
	Group III	3,539.2	66,971,216	32.4	1,809.4	51.1	35,673,960	53.3	33.6	1,729.8	48.9	31,297,256	46.7	30.9
	Group IV	[2] 2,198.4	42,782,111	33.6	832.6	38.2	18,108,159	42.3	36.3	1,346.4	61.8	24,673,952	57.7	31.2
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.													
1	New York, N. Y	2,112.9	38,204,111	30.9	1,269.8	60.1	26,470,407	69.3	35.4	843.1	39.9	11,733,704	30.7	23.7
2	Chicago, Ill	1,542.8	24,684,800	27.3	966.5	62.6	15,464,320	62.6	27.3	576.3	37.4	9,220,480	37.4	27.3
3	Philadelphia, Pa	1,365.4	19,845,596	24.9	1,070.4	78.4	16,698,182	84.1	26.4	295.0	21.6	3,147,414	15.9	18.3
4	St. Louis, Mo	570.8	12,647,612	37.8	294.1	51.5	6,803,285	53.8	39.3	276.7	48.5	5,844,327	46.2	36.0
5	Boston, Mass	509.8	9,680,322	32.1	132.9	26.1	2,852,448	29.5	36.6	376.9	73.9	6,827,874	70.5	30.9
6	Baltimore, Md	408.8	7,127,727	29.7	356.6	87.2	6,482,652	90.9	30.9	52.2	12.8	645,075	9.1	21.0
7	Cleveland, Ohio	385.4	7,743,917	34.2	383.9	99.6	7,715,928	99.6	34.2	1.5	0.4	27,989	0.4	31.8
8	Pittsburgh, Pa	[3] 508.9	[3] *7,610,008*	25.5	498.3	97.9	*7,448,808*	97.8	25.5	10.6	2.1	*167,200*	2.2	27.0
9	Detroit, Mich	387.7	7,188,306	31.5	370.9	95.7	6,802,342	94.6	31.2	16.8	4.3	385,964	5.4	39.3
10	Buffalo, N. Y	359.4	7,450,382	35.4	345.6	96.2	7,152,445	96.0	35.4	13.8	3.8	297,937	4.0	36.9
11	San Francisco, Cal	314.0	7,425,880	40.2	268.0	85.4	6,332,736	85.3	40.2	46.0	14.6	1,093,144	14.7	40.5
12	Cincinnati, Ohio	[3] 496.9	[3] 8,745,088	30.0	262.9	52.9	4,626,512	52.9	30.0	234.0	47.1	4,118,576	47.1	30.0
13	Milwaukee, Wis	354.0	7,810,379	37.5	80.5	22.7	2,031,558	26.0	42.9	273.5	77.3	5,778,821	74.0	36.0
14	Newark, N. J	201.1	3,819,375	32.4	171.3	85.2	3,413,434	89.4	33.9	29.8	14.8	405,941	10.6	23.1
15	New Orleans, La	274.4	4,719,262	29.4	203.5	74.2	3,472,361	73.6	28.1	70.9	25.8	1,246,901	26.4	30.0
16	Washington, D. C	363.3	*6,999,913*	32.7	206.5	56.8	4,608,780	65.8	38.1	156.8	43.2	*2,391,133*	34.2	26.1
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.													
17	Minneapolis, Minn	137.0	2,170,714	27.0	120.7	88.1	1,911,713	88.1	27.0	16.3	11.9	259,001	11.9	27.0
18	Los Angeles, Cal	528.9	12,545,860	40.2	59.8	11.3	1,526,037	12.2	33.5	469.1	88.7	11,019,823	87.8	39.9
19	Jersey City, N. J	[3] 132.2	[3] 2,423,156	31.2	108.7	82.2	1,913,205	79.0	30.0	23.5	17.8	509,951	21.0	36.9
20	Kansas City, Mo	275.8	5,689,980	35.1	236.3	85.7	4,730,272	83.1	34.2	39.5	14.3	959,708	16.9	41.1
21	Indianapolis, Ind	[3] 286.0	[3] 4,459,238	29.1	166.4	58.2	2,969,755	69.4	34.5	119.6	41.8	1,489,483	30.6	21.3
22	Louisville, Ky	194.8	*4,114,173*	36.0	122.4	62.8	*2,536,142*	62.9	36.0	72.4	37.2	*1,528,031*	37.1	12.0
23	Seattle, Wash	[3] 182.7	[3] 2,954,233	27.6	181.3	99.2	2,928,828	99.1	28.6	1.4	0.8	25,405	0.9	30.9
24	Providence, R. I	[3] 246.6	[3] 4,340,818	30.0	46.0	18.7	809,202	18.6	30.0	200.6	81.3	3,531,616	81.4	30.0
25	Rochester, N. Y	187.4	3,173.500	28.8	144.4	77.1	2,589,737	81.6	30.6	43.0	22.9	583,763	18.4	23.1
26	St. Paul, Minn	110.8	2,298,740	35.4	51.2	46.2	1,258,838	54.8	42.0	59.6	53.8	1,039,902	45.2	29.9
27	Denver, Colo	128.4	2,867,116	38.1	24.7	19.2	622,076	21.7	42.9	103.7	80.8	2,245,040	78.3	36.9
28	Portland, Oreg	261.0	4,162,324	27.3	73.2	28.0	1,309,272	31.5	30.6	187.8	72.0	2,853,052	68.5	25.8
29	Columbus, Ohio	[3] 189.8	[3] 3,697,214	33.3	181.7	95.7	3,553,704	96.1	33.3	8.1	4.3	143,510	3.9	30.3
30	Toledo, Ohio	181.9	3,196,043	30.0	167.6	92.1	3,051,283	95.5	30.9	14.3	7.9	144,760	4.5	17.4
31	Worcester, Mass	211.2	3,304,071	26.7	23.8	11.3	327,025	9.9	23.4	187.4	88.7	2,977,046	90.1	27.0
32	Atlanta, Ga	115.9	2,535,682	37.2	62.9	54.3	1,447,415	57.0	39.3	53.0	45.7	1,088,267	43.0	35.1
33	Syracuse, N. Y	68.7	1,374,160	34.2	68.1	99.1	1,365,321	99.4	34.2	0.6	0.9	8,839	0.6	25.2
34	New Haven, Conn	[3] 82.9	[3] 1,532,523	31.5	16.6	20.0	361,293	23.5	37.2	66.3	80.0	1,171,230	76.5	30.0
35	Scranton, Pa	[3] 34.0	[3] 595,217	29.7	34.0	100.0	595,217	100.0	29.7	....	....	....	....	....
36	Paterson, N. J	92.9	1,883,807	34.5	23.7	25.5	421,473	22.4	30.3	69.2	74.5	1,462,334	77.6	36.0
37	Omaha, Nebr	117.9	2,552,740	36.9	113.4	96.2	2,489,286	97.5	37.5	4.5	3.8	63,454	2.5	24.6
38	Fall River, Mass	*95.9*	*1,508,726*	26.7	15.6	16.3	280,526	18.6	30.6	*80.3*	83.7	*1,228,200*	81.4	26.1
39	Memphis, Tenn	150.9	3,510,425	39.6	57.0	37.8	1,363,120	38.8	40.8	93.9	62.2	2,147,305	61.2	39.0
40	Richmond, Va	116.4	2,493,632	36.6	44.0	37.8	1,047,187	42.0	40.5	72.4	62.2	1,446,445	58.0	34.2
41	Oakland, Cal	229.3	4,749,762	35.4	13.1	5.7	310,162	6.5	40.5	216.2	94.3	4,439,600	93.5	35.1
42	Grand Rapids, Mich	187.7	3,561,296	32.4	32.4	17.3	782,138	22.0	41.1	155.3	82.7	2,779,158	78.0	30.6
43	Nashville, Tenn	179.6	3,129,279	29.7	16.0	8.9	282,219	9.0	30.0	163.6	91.1	2,847,060	91.0	29.7
44	Lowell, Mass	137.6	2,402,980	29.7	21.8	15.8	399,607	16.6	31.2	115.8	84.2	2,003,373	83.4	29.4
45	Cambridge, Mass	102.3	1,652,796	27.6	17.6	17.2	432,270	26.2	42.0	84.7	82.8	1,220,526	73.8	24.6
46	Dayton, Ohio	52.9	1,135,385	36.6	52.0	98.3	1,116,280	98.3	36.6	0.9	1.7	19,105	1.7	36.3

---

[1] Exclusive of roadways in parks.

[2] Length (miles) for Montgomery, Ala., reported in the aggregate, but not in the subdivisions.

[3] Includes alleys.

TABLE 20.—HIGHWAYS—LENGTH, AREA, AND AVERAGE WIDTH OF PAVED STREETS,[1] CLASSIFIED AS WITH DURABLE AND NONDURABLE PAVEMENTS, WITH PER CENT OF THE TOTAL LENGTH AND AREA IN EACH CLASS: 1909—Con.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 65. Figures printed in italics are estimates.]

City number.	CITY.	ALL PAVEMENTS. Length (miles).	ALL PAVEMENTS. Area (square yards).	ALL PAVEMENTS. Average width (feet).	DURABLE PAVEMENTS. Length. Miles.	DURABLE PAVEMENTS. Length. Per cent of total.	DURABLE PAVEMENTS. Area. Square yards.	DURABLE PAVEMENTS. Area. Per cent of total.	DURABLE PAVEMENTS. Average width (feet).	NONDURABLE PAVEMENTS. Length. Miles.	NONDURABLE PAVEMENTS. Length. Per cent of total.	NONDURABLE PAVEMENTS. Area. Square yards.	NONDURABLE PAVEMENTS. Area. Per cent of total.	NONDURABLE PAVEMENTS. Average width (feet).
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.													
47	Albany, N. Y	89.9	1,581,708	30.0	83.5	92.9	1,468,469	92.8	30.0	6.4	7.1	113,239	7.2	30.3
48	Bridgeport, Conn	*80.7*	*1,448,638*	30.6	8.0	9.9	169,118	11.7	36.0	*72.7*	90.1	*1,279,520*	88.3	30.0
49	Spokane, Wash	13.2	417,838	54.0	12.1	91.7	379,311	90.8	53.4	1.1	8.3	38,527	9.2	59.7
50	Hartford, Conn	*104.6*	*1,904,270*	30.9	9.6	9.2	232,270	12.2	41.1	*95.0*	90.8	*1,672,000*	87.8	30.0
51	Reading, Pa	[2] 79.0	[2] 2,073,461	44.7	27.2	34.4	555,633	26.7	34.8	51.8	65.6	1,517,828	73.3	49.8
52	Trenton, N. J	[2] 39.4	[2] 710,264	30.6	28.5	72.4	555,631	78.2	33.0	10.9	27.6	154,633	21.8	24.3
53	San Antonio, Tex	*165.1*	*3,338,250*	34.5	10.9	6.6	203,730	6.1	31.8	*154.2*	93.4	*3,134,520*	93.9	34.5
54	New Bedford, Mass	97.8	1,256,447	21.9	22.8	23.3	316,004	25.2	23.7	75.0	76.7	940,443	74.8	21.3
55	Camden, N. J	70.0	1,046,349	25.5	66.0	94.3	984,460	94.1	24.0	4.0	5.7	61,889	5.9	26.4
56	Dallas, Tex	67.6	1,310,399	33.0	20.3	30.0	473,141	36.1	39.6	47.3	70.0	837,258	63.9	30.3
57	Salt Lake City, Utah	23.9	840,692	60.0	20.6	86.2	765,526	91.1	63.3	3.3	13.8	75,166	8.9	38.7
58	Lynn, Mass	25.9	576,077	37.8	7.6	29.3	183,238	31.8	41.1	18.3	70.7	392,839	68.2	36.6
59	Wilmington, Del	[2] 62.9	1,094,050	29.7	43.2	68.7	806,455	73.7	31.8	19.7	31.3	287,595	26.3	24.9
60	Springfield, Mass	157.5	2,843,113	30.9	10.9	6.9	217,405	7.6	33.9	146.6	93.1	2,625,708	92.4	30.6
61	Des Moines, Iowa	72.0	1,445,915	34.2	71.3	99.0	1,434,472	99.2	34.2	0.7	1.0	11,443	0.8	27.9
62	Lawrence, Mass	33.4	633,963	32.4	7.4	22.2	172,252	27.2	39.6	26.0	77.8	461,711	72.8	30.3
63	St. Joseph, Mo	75.8	1,405,586	31.5	47.6	62.8	911,918	64.9	32.7	28.2	37.2	493,668	35.1	29.7
64	Troy, N. Y	52.6	887,159	28.8	49.6	94.3	833,616	94.0	28.5	3.0	5.7	53,543	6.0	30.3
65	Yonkers, N. Y	98.6	1,499,148	25.8	10.5	10.6	207,148	13.8	33.6	88.1	89.4	1,292,000	86.2	27.9
66	Tacoma, Wash	[2] 49.9	[2] 1,140,508	39.0	49.6	99.4	1,134,336	99.5	39.0	0.3	0.6	6,172	0.5	35.1
67	Youngstown, Ohio	46.0	827,212	30.6	45.1	98.0	811,985	9.8	30.6	0.9	2.0	15,227	90.2	28.8
68	Duluth, Minn	113.6	2,800,873	42.0	26.4	23.2	649,333	23.2	42.0	87.2	76.8	2,151,540	76.8	42.0
69	Houston, Tex	75.3	1,266,240	28.8	23.6	31.3	554,951	43.8	40.2	51.7	68.7	711,289	56.2	23.4
70	Somerville, Mass	80.4	1,050,925	22.2	8.3	10.3	167,992	16.0	34.5	72.1	89.7	882,933	84.0	21.0
71	Kansas City, Kans	67.0	1,406,407	35.7	65.1	97.2	1,373,224	97.6	36.0	1.9	2.8	33,183	2.4	29.7
72	Utica, N. Y	66.7	1,194,175	30.6	65.8	98.7	1,184,579	99.2	30.6	0.9	1.3	9,596	0.8	18.3
73	Waterbury, Conn	[2] *16.1*	[2] *316,055*	33.6	9.1	56.5	193,205	61.1	36.3	*7.0*	43.5	*122,850*	38.9	30.0
74	Elizabeth, N. J	50.3	947,578	32.1	31.2	62.0	668,773	70.6	36.6	19.1	38.0	278,805	29.4	24.9
75	Schenectady, N. Y	49.9	895,923	30.6	47.9	96.0	860,974	96.1	30.6	2.0	4.0	34,949	3.9	29.7
76	Hoboken, N. J	22.1	404,885	31.2	21.4	96.8	392,621	97.0	31.2	0.7	3.2	12,264	3.0	30.0
77	Manchester, N. H	*36.7*	*620,532*	28.8	6.2	16.9	137,412	22.1	37.8	*30.5*	83.1	*483,120*	77.9	27.0
78	Evansville, Ind	47.9	1,039,330	36.9	39.7	82.9	872,197	83.9	37.5	8.2	17.1	167,133	16.1	34.8
79	Birmingham, Ala	83.2	1,962,731	40.2	18.2	21.9	508,334	25.9	47.7	65.0	78.1	1,454,397	74.1	38.1
80	Akron, Ohio	56.0	1,002,316	31.2	49.2	87.9	895,229	89.3	30.9	6.8	12.1	107,087	10.7	26.7
81	Norfolk, Va	59.4	1,021,570	29.4	46.0	77.4	839,028	82.1	31.2	13.4	22.6	182,542	17.9	23.1
82	Fort Worth, Tex	81.9	1,478,103	30.9	6.9	8.4	158,103	10.7	39.0	75.0	91.6	1,320,000	89.3	30.0
83	Wilkes-Barre, Pa	27.9	449,816	27.6	27.8	99.6	448,833	99.8	27.6	0.1	0.4	983	0.2	16.5
84	Erie, Pa	41.1	896,455	37.2	41.1	100.0	896,455	100.0	37.2	....	....	....	....	....
85	Savannah, Ga	45.0	868,006	33.0	40.5	90.0	779,167	89.8	32.7	4.5	10.0	88,839	10.2	33.6
86	Peoria, Ill	58.8	1,159,037	33.6	57.8	98.3	1,141,773	98.5	33.6	1.0	1.7	17,264	1.5	29.4
87	Harrisburg, Pa	51.7	949,997	31.2	41.7	80.7	763,997	80.4	31.2	10.0	19.3	186,000	19.6	31.5
88	Fort Wayne, Ind	44.6	847,640	32.4	44.6	100.0	847,640	100.0	32.4	....	....	....	....	....
89	Charleston, S. C	[2] 37.4	[2] 602,384	27.6	25.2	67.4	412,342	68.5	27.9	12.2	32.6	190,042	31.5	26.7
90	Portland, Me	*119.4*	*2,252,000*	32.1	34.3	28.7	606,438	26.9	30.0	*85.1*	71.3	*1,645,562*	73.1	33.0
91	Terre Haute, Ind	82.1	1,766,316	36.6	24.1	29.4	505,350	28.6	35.7	58.0	70.6	1,260,966	71.4	37.2
92	East St. Louis, Ill	*48.2*	*1,017,350*	36.0	*45.2*	93.8	*953,990*	93.8	36.0	*3.0*	6.2	*63,360*	6.2	36.0
93	Holyoke, Mass	46.4	835,812	30.6	11.2	24.1	217,172	26.0	33.0	35.2	75.9	618,640	74.0	30.0
94	Brockton, Mass	32.3	487,923	25.8	11.8	36.5	205,858	42.2	29.7	20.5	63.5	282,065	57.8	23.4
95	Johnstown, Pa	23.0	410,080	30.3	23.0	100.0	410,080	100.0	30.3	....	....	....	....	....
96	Jacksonville, Fla	58.3	1,129,099	33.0	35.3	60.5	724,827	64.2	35.1	23.0	39.5	404,272	35.8	30.0
97	Oklahoma City, Okla	79.2	1,643,345	35.4	78.4	99.0	1,631,905	99.3	35.7	0.8	1.0	11,440	0.7	24.3
98	Bayonne, N. J	20.3	526,520	44.1	9.3	45.8	225,807	42.9	41.4	11.0	54.2	300,713	57.1	16.5
99	Covington, Ky	56.0	926,768	28.2	17.2	30.7	312,176	33.7	30.9	38.8	69.3	614,592	66.3	27.0
100	South Bend, Ind	[2] 51.8	[2] 1,125,584	36.9	49.5	95.6	1,069,755	95.0	36.9	2.3	4.4	55,829	5.0	41.4
101	Passaic, N. J	[2] 34.8	[2] 553,730	27.0	3.3	9.5	54,770	9.9	28.2	31.5	90.5	498,960	90.1	27.0
102	Altoona, Pa	[2] 28.8	[2] 427,520	25.2	28.2	97.9	417,520	97.7	25.2	0.6	2.1	10,000	2.3	28.5
103	Mobile, Ala	22.9	*411,940*	30.6	18.9	82.5	303,940	73.8	27.3	4.0	17.5	*108,000*	26.2	45.9
104	Allentown, Pa	23.3	450,957	33.0	14.5	62.2	315,077	69.9	36.9	8.8	37.8	135,880	30.1	26.4
105	Pawtucket, R. I	93.6	1,544,247	28.2	9.2	9.8	157,015	10.2	29.1	84.4	90.2	1,387,232	89.8	27.6

[1] Exclusive of roadways in parks.

[2] Includes alleys.

TABLE 20.—HIGHWAYS—LENGTH, AREA, AND AVERAGE WIDTH OF PAVED STREETS,[1] CLASSIFIED AS WITH DURABLE AND NONDURABLE PAVEMENTS, WITH PER CENT OF THE TOTAL LENGTH AND AREA IN EACH CLASS: 1909—Con.

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 65. Figures printed in italics are estimates.]

City number.	CITY.	ALL PAVEMENTS.			DURABLE PAVEMENTS.					NONDURABLE PAVEMENTS.				
		Length (miles).	Area (square yards).	Average width (feet).	Length.		Area.		Average width (feet).	Length.		Area.		Average width (feet).
					Miles.	Per cent of total.	Square yards.	Per cent of total.		Miles.	Per cent of total.	Square yards.	Per cent of total.	
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.													
106	Saginaw, Mich	[2] 65.7	[2] 1,239,250	32.1	43.5	66.2	867,426	70.0	33.9	22.2	33.8	371,824	30.0	28.5
107	Canton, Ohio	23.9	537,631	38.4	23.9	100.0	537,631	100.0	38.4	....	....	....	....	....
108	Wichita, Kans	[2] 19.1	[2] 470,235	42.0	18.6	97.4	463,842	98.6	42.6	0.5	2.6	6,393	1.4	21.9
109	Springfield, Ill	52.4	1,203,225	39.0	50.9	97.1	1,164,355	96.8	39.0	1.5	2.9	38,870	3.2	44.1
110	Binghamton, N. Y	17.6	367,352	35.4	12.6	71.6	279,352	76.0	37.8	5.0	28.4	88,000	24.0	30.0
111	Lancaster, Pa	[2] 49.4	[2] 887,708	30.6	8.9	18.0	158,992	17.9	30.3	40.5	82.0	728,716	82.1	30.9
112	Sioux City, Iowa	16.5	439,292	45.3	16.5	100.0	439,292	100.0	45.3	....	....	....	....	....
113	Little Rock, Ark	30.9	586,100	32.4	15.9	51.5	302,880	51.7	32.4	15.0	48.5	283,220	48.3	32.1
114	Springfield, Ohio	78.5	1,821,323	39.6	12.9	16.4	306,913	16.9	40.5	65.6	83.6	1,514,410	83.1	39.3
115	Atlantic City, N. J	58.0	1,085,762	31.8	16.9	29.1	416,045	38.3	42.0	41.1	70.9	669,717	61.7	27.6
116	Bay City, Mich	39.2	679,543	29.4	35.5	90.6	646,708	95.2	31.2	3.7	9.4	32,835	4.8	15.0
117	Rockford, Ill	60.9	1,238,046	34.8	4.0	6.6	102,907	8.3	43.8	56.9	93.4	1,135,139	91.7	33.9
118	York, Pa	30.5	548,000	30.6	5.5	18.0	98,000	17.9	30.3	25.0	82.0	450,000	82.1	30.6
119	Lincoln, Nebr	35.1	802,099	39.0	35.1	100.0	802,099	100.0	39.0	....	....	....	....	....
120	Chattanooga, Tenn	35.0	539,138	26.4	13.3	38.0	280,542	52.0	36.0	21.7	62.0	258,596	48.0	20.4
121	Topeka, Kans	[2] 52.2	[2] 960,443	31.5	50.2	96.2	951,056	99.0	32.4	2.0	3.8	9,387	1.0	8.1
122	Sacramento, Cal	54.7	1,529,459	47.7	9.6	17.6	260,569	17.0	46.5	45.1	82.4	1,268,890	83.0	47.7
123	Malden, Mass	*61.4*	*1,302,144*	36.0	1.1	1.8	25,242	1.9	39.0	*60.3*	98.2	*1,276,902*	98.1	36.0
124	Haverhill, Mass	24.8	363,651	24.9	8.0	32.3	132,746	36.5	28.2	16.8	67.7	230,905	63.5	23.4
125	Pueblo, Colo	5.5	161,025	49.8	4.4	80.0	141,518	87.9	54.9	1.1	20.0	19,507	12.1	30.3
126	Salem, Mass	*53.4*	*965,264*	30.9	*5.3*	9.9	*106,604*	11.0	34.2	*48.1*	90.1	*858,660*	89.0	30.3
127	New Britain, Conn	*22.8*	*401,340*	30.0	0.2	0.9	3,580	0.9	30.6	*22.6*	99.1	*397,760*	99.1	30.0
128	Davenport, Iowa	50.1	1,179,669	40.2	49.4	98.6	1,171,738	99.3	40.5	0.7	1.4	7,931	0.7	19.2
129	McKeesport, Pa	31.7	460,689	24.9	31.1	98.1	450,689	97.8	24.6	0.6	1.9	10,000	2.2	28.5
130	Wheeling, W. Va	33.3	594,594	30.3	29.4	88.3	513,879	86.4	29.7	3.9	11.7	80,715	13.6	35.4
131	Augusta, Ga	[2] 60.8	[2] 1,263,589	35.4	6.0	9.9	165,859	13.1	47.1	54.8	90.1	1,097,730	86.9	34.2
132	Superior, Wis	49.8	1,311,188	45.0	32.6	65.5	907,808	69.2	47.4	17.2	34.5	403,380	30.8	39.9
133	Newton, Mass	141.9	3,505,920	42.0	25.0	1.8	692,266	19.7	47.4	116.9	98.2	2,813,654	80.3	41.1
134	Dubuque, Iowa	80.6	1,221,791	25.8	8.4	10.4	160,520	13.1	32.7	72.2	89.6	1,061,271	86.9	27.3
135	Butte, Mont	3.3	93,597	48.3	3.3	100.0	93,597	100.0	48.3	....	....	....	....	....
136	Chester, Pa	25.0	437,172	29.7	18.6	74.4	329,112	75.3	30.3	6.4	25.6	108,060	24.7	28.5
137	Kalamazoo, Mich	16.1	363,148	38.4	15.8	98.1	355,682	97.9	38.4	0.3	1.9	7,466	2.1	42.3
138	Montgomery, Ala	[3] 19.4	437,891	38.4	(3)	....	334,888	76.5	....	(3)	....	103,003	23.5	....
139	Woonsocket, R. I	48.1	631,947	22.5	2.3	4.8	40,822	6.5	30.3	45.8	95.2	591,125	93.5	21.9
140	Galveston, Tex	39.5	828,072	35.7	7.5	19.0	171,016	20.7	39.0	32.0	81.0	657,056	79.3	35.1
141	Fitchburg, Mass	21.3	283,733	22.8	7.2	33.8	136,285	48.0	32.4	14.1	66.2	147,448	52.0	17.7
142	Racine, Wis	22.9	447,489	33.3	20.2	8.8	385,435	86.1	32.4	2.7	91.2	62,054	13.9	39.3
143	Elmira, N. Y	58.1	936,710	27.6	11.1	19.1	249,147	26.6	38.4	47.0	80.9	687,563	73.4	24.9
144	Quincy, Ill	40.3	*835,720*	35.1	27.6	68.5	*612,200*	73.3	37.8	12.7	31.5	223,520	26.7	30.0
145	Knoxville, Tenn	78.0	1,411,838	30.6	20.5	26.3	395,949	28.0	33.0	57.5	73.7	1,015,889	72.0	30.0
146	New Castle, Pa	22.9	370,728	27.6	22.4	97.8	361,928	97.6	27.6	0.5	2.2	8,800	2.4	30.0
147	Macon, Ga	[2] 5.9	[2] 92,456	26.7	5.9	100.0	92,456	100.0	26.7	....	....	....	....	....
148	Auburn, N. Y	*44.9*	*794,322*	30.3	6.9	15.4	170,109	21.4	42.0	*38.0*	84.6	*624,213*	78.6	27.9
149	West Hoboken, N. J	17.9	*335,144*	31.8	15.0	83.8	267,560	79.8	30.3	2.9	16.2	*67,584*	20.2	39.6
150	Joliet, Ill	31.6	678,847	36.6	11.5	36.4	262,381	38.7	39.0	20.1	63.6	416,466	61.3	35.4
151	Taunton, Mass	96.2	1,256,141	22.2	7.1	7.4	96,427	7.7	23.1	89.1	92.6	1,159,714	92.3	22.2
152	Everett, Mass	38.8	544,902	23.7	1.8	4.6	23,379	4.3	22.2	37.0	95.4	521,523	95.7	24.0
153	Oshkosh, Wis	51.3	958,402	31.8	15.6	30.4	312,810	32.6	34.2	35.7	69.6	645,592	67.4	30.9
154	Chelsea, Mass	*37.3*	*657,850*	30.0	*6.4*	17.2	*112,878*	17.2	30.0	*30.9*	82.8	*544,972*	82.8	30.0
155	Joplin, Mo	65.6	1,089,943	28.2	4.7	7.2	111,805	10.3	40.5	60.9	92.8	978,138	89.7	27.3
156	La Crosse, Wis	40.4	753,973	31.8	8.0	19.8	161,939	21.6	34.5	32.4	80.2	592,034	78.4	31.2
157	Newport, Ky	27.3	559,215	34.8	7.9	28.9	161,895	29.0	34.8	19.4	71.1	397,320	71.0	34.8
158	South Omaha, Nebr	[2] 10.6	[2] 317,401	51.0	10.6	100.0	317,401	100.0	51.0	....	....	....	....	....

[1] Exclusive of roadways in parks.
[2] Includes alleys.
[3] Length (miles) reported in the aggregate, but not in the subdivisions.

TABLE 21.—HIGHWAYS—LENGTH AND AREA OF PRINCIPAL KINDS OF

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see

City number.	CITY.	DURABLE PAVEMENTS. Sheet asphalt. Length (miles).	Sheet asphalt. Area (square yards).	Block asphalt. Length (miles).	Block asphalt. Area (square yards).	Bitulithic. Length (miles).	Bitulithic. Area (square yards).	Tar-bound macadam. Length (miles).	Tar-bound macadam. Area (square yards).	Granite and Belgian block. Length (miles).	Granite and Belgian block. Area (square yards).	Cobblestone. Length (miles).	Cobblestone. Area (square yards).
	Grand total	4,292.7	83,227,011	261.1	5,418,666	207.7	4,317,872	142.4	3,008,919	2,596.1	51,414,901	536.3	9,083,397
	Group I	2,690.0	50,535,568	200.9	4,260,432	68.7	1,602,604	24.0	442,058	1,798.7	35,814,907	445.3	7,482,592
	Group II	846.4	16,837,691	20.9	467,308	72.1	1,335,202	30.6	703,837	464.1	9,307,275	22.8	426,226
	Group III	590.9	12,230,380	26.0	457,275	39.3	786,542	50.7	963,470	270.9	4,989,231	62.9	1,081,427
	Group IV	165.4	3,623,372	13.3	233,651	27.6	593,524	37.1	899,554	62.4	1,303,488	5.3	93,152
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.												
1	New York, N. Y	689.4	13,737,971	132.9	2,985,743			5.6	115,923	379.6	8,398,405	19.3	340,250
2	Chicago, Ill	468.6	7,496,800	1.7	27,840			2.0	32,000	69.9	1,119,040		
3	Philadelphia, Pa	448.9	7,031,225	15.8	151,141					392.7	6,474,322	27.0	283,029
4	St. Louis, Mo	53.8	1,279,685			33.9	862 820			70.1	1,638,552		
5	Boston, Mass	19.1	319,445	([2])	95	6.2	115,138	5.0	85,667	96.4	2,208,517	0.3	2,239
6	Baltimore, Md	14.2	346,282	16.6	404,108	9.1	240,224	1.5	26,599	51.1	1,045,318	251.2	4,168,947
7	Cleveland, Ohio	24.6	443,651			0.4	10,289	0.7	14,008	95.6	2,734,337		
8	Pittsburgh, Pa	183.2	*2,941,217*	1.2	*19,960*					232.1	*3,550,552*	22.2	*340,278*
9	Detroit, Mich	71.2	1,350,115	2.7	44,719			0.3	5,251	3.9	85,187	1.0	19,813
10	Buffalo, N. Y	233.0	4,535,488							90.8	2,233,521		
11	San Francisco, Cal	149.8	3,564,828							103.5	2,419,450	14.7	348,458
12	Cincinnati, Ohio	42.7	751,344	1.0	17,600	5.6	99,088	5.3	92,400	66.2	1,164,592	65.2	1,148,224
13	Milwaukee, Wis	25.8	696,120			1.4	35,985			11.7	309,150		
14	Newark, N. J	50.7	1,040,917	0.7	14,784	8.2	158,980	3.6	70,210	69.0	1,349,655	4.7	99,475
15	New Orleans, La	69.5	1,630,933			3.9	80,080			41.1	618,933	32.9	575,579
16	Washington, D. C	145.5	3,369,547	28.3	595,142					25.0	465,376	6.8	156,300
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.												
17	Minneapolis, Minn	10.3	[1]163,753							40.1	635,415		
18	Los Angeles, Cal	47.8	1,239,040			6.6	164,267			2.1	46,933		
19	Jersey City, N. J	26.1	459,060							80.0	1,409,108		
20	Kansas City, Mo	190.8	3,840,037			1.5	28,580			3.5	88,997		
21	Indianapolis, Ind	62.6	1,319,534			8.6	146,619					0.2	440
22	Louisville, Ky	39.8	*840,787*							19.2	*405,081*	7.2	*158,486*
23	Seattle, Wash	84.2	1,239,725							1.6	31,952		
24	Providence, R. I	5.1	90,055			1.2	21,189	0.4	6,785	33.9	595,972	5.0	87,329
25	Rochester, N. Y	66.7	1,065,449	0.9	13,211	1.0	20,800			31.5	705,833	([2])	118
26	St. Paul, Minn	29.9	677,028					3.1	121,233	9.6	232,641		
27	Denver, Colo	21.1	540,640							3.6	81,436		
28	Portland, Oreg	21.5	397,738			30.9	534,429	0.1	3,084	5.6	118,932		
29	Columbus, Ohio	24.8	498,270	0.1	1,853			0.7	8,055	24.5	497,394	4.3	50,450
30	Toledo, Ohio	17.1	291,122	10.4	211,201	1.5	34,933	0.6	15,193	23.1	446,749		
31	Worcester, Mass	0.7	12,698			1.5	23,659	3.0	38,574	16.7	221,076	0.1	447
32	Atlanta, Ga	7.2	167,895			2.9	59,547			48.3	1,133,440		
33	Syracuse, N. Y	43.1	780,846			0.2	3,767			1.8	85,627		
34	New Haven, Conn	3.3	69,329			1.6	40,830	0.4	5,550	2.7	58,534	0.1	3,710
35	Scranton, Pa	21.5	403,809			3.0	28,818			2.9	38,904		
36	Paterson, N. J	7.1	124,946					0.9	17,296	6.1	108,201	0.8	14,580
37	Omaha, Nebr	51.5	1,130,932							20.8	534,502		
38	Fall River, Mass	0.4	7,621							14.4	258,703	0.5	8,744
39	Memphis, Tenn	27.1	669,558					13.8	309,056	2.3	55,827	3.8	90,041
40	Richmond, Va	0.4	7,153	8.0	200,495					34.9	825,397	0.6	11,864
41	Oakland, Cal	5.3	124,373			0.1	3,334	7.1	166,615				
42	Grand Rapids, Mich	5.6	147,523	1.4	38,148			0.1	2,692	0.3	6,017	0.2	6,017
43	Nashville, Tenn					6.6	116,669	0.2	3,994	7.2	126,180		
44	Lowell, Mass	3.6	76,780			1.3	23,507			16.0	281,866		
45	Cambridge, Mass	0.2	5,315			2.8	69,024	0.2	5,711	9.8	241,438		
46	Dayton, Ohio	21.6	446,675	0.1	2,400	0.8	15,230			1.6	35,120		

[1] Exclusive of roadways in parks.

[2] Less than one-tenth of 1 mile.

PAVED STREETS,[1] CLASSIFIED ACCORDING TO KIND OF SURFACE: 1909.

page 85. For a text discussion of this table, see page 65. Figures printed in italics are estimates.]

DURABLE PAVEMENTS—continued.								NONDURABLE PAVEMENTS.								City number.
Brick.		Creosoted wood block.		Untreated wood block.		Other.		Oil-bound macadam.		Water-bound macadam.		Water-bound gravel.		Other.		
Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	
2,807.2	53,870,578	156.1	2,936,047	613.8	10,724,370	206.7	2,931,154	66.9	2,045,686	6,261.7	106,910,522	2,242.6	41,212,992	501.9	10,369,475	
993.7	17,744,960	56.7	1,089,441	529.8	8,708,805	73.9	688,826	23.9	999,069	3,060.1	49,285,695	149.2	2,345,633	40.7	702,083	
643.5	12,272,379	78.7	1,402,424	14.9	306,655	102.4	1,721,606	10.3	217,588	1,293.4	23,778,209	1,076.8	19,573,581	342.5	7,665,609	
709.0	13,882,671	15.4	322,647	19.1	528,806	25.2	431,511	7.2	112,640	1,072.0	18,854,925	608.6	11,644,413	42.0	685,278	
461.0	9,970,568	5.3	121,535	50.0	1,180,104	5.2	89,211	25.5	716,389	836.2	14,991,693	408.0	7,649,365	76.7	1,316,505	
GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.																
17.1	354,374	22.3	467,757	...	...	3.6	69,984	5.7	584,431	837.4	11,149,273	...	...	...	...	1
82.7	1,323,040	11.0	176,320	325.6	5,209,760	5.0	79,520	...	...	569.2	9,106,560	...	...	7.1	113,920	2
165.9	2,588,459	1.5	55,000	...	...	18.6	115,006	...	...	295.0	3,147,414	...	...	...	...	3
133.5	2,966,674	2.8	55,554	...	...	...	...	...	...	276.7	5,844,327	...	...	...	...	4
1.4	21,891	2.4	55,709	...	...	2.1	43,747	3.2	58,448	342.4	6,289,961	31.3	479,465	...	...	5
11.2	217,582	1.7	33,592	...	...	...	...	...	...	52.2	645,075	...	...	...	...	6
261.5	4,493,755	1.1	19,888	...	...	...	...	...	...	1.5	27,989	...	...	...	...	7
58.9	*583,348*	0.7	*8,148*	...	...	...	...	...	...	10.6	*167,200*	...	...	...	...	8
101.5	2,114,378	5.3	89,122	185.0	3,093,757	...	...	15.0	356,190	...	...	...	...	1.8	29,774	9
21.8	383,436	...	...	...	...	...	...	...	...	13.8	297,937	...	...	...	...	10
...	...	...	...	...	...	...	...	...	...	46.0	1,093,144	...	...	...	...	11
72.4	1,273,360	4.5	79,904	...	...	...	...	...	...	228.5	4,021,776	5.5	96,800	...	...	12
20.9	550,695	1.5	34,320	19.2	405,288	...	...	...	...	273.5	5,778,821	...	...	...	...	13
33.9	673,617	0.5	5,796	...	...	...	...	...	...	29.8	405,941	...	...	...	...	14
10.1	177,936	1.4	8,331	...	...	44.6	380,569	...	...	...	...	39.1	688,512	31.8	558,389	15
0.9	22,415	...	...	...	...	...	...	...	...	83.5	1,310,277	73.3	1,080,856	...	...	16
GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.																
21.6	341,720	40.2	636,139	8.5	134,686	...	...	...	...	16.3	259,001	...	...	...	...	17
3.3	75,797	...	...	...	...	...	...	4.9	117,333	...	...	275.3	6,455,556	188.9	4,446,934	18
0.7	11,756	1.9	33,281	...	...	...	...	...	...	[3] 23.5	[3] 509,951	...	...	...	...	19
40.3	766,988	0.2	5,670	...	...	...	...	...	...	38.8	947,639	...	...	0.7	12,069	20
71.8	1,044,519	20.8	396,017	2.4	62,626	...	...	...	...	10.0	209,483	109.6	*1,880,000*	...	...	21
56.2	*1,187,788*	...	...	...	...	...	...	...	...	71.5	*1,509,446*	0.9	*18,585*	...	...	22
12.7	293,183	0.1	4,360	...	...	82.7	1,359,608	...	...	1.4	25,405	...	...	...	...	23
0.4	7,872	...	...	...	...	...	...	...	...	200.6	3,531,616	...	...	...	...	24
44.3	784,326	...	...	...	...	...	...	1.8	26,359	28.8	385,219	12.4	172,185	...	...	25
7.5	205,564	0.9	16,399	0.2	5,973	...	...	0.7	22,723	43.7	728,494	15.2	288,685	...	...	26
...	...	...	...	...	...	...	...	...	...	9.8	204,957	...	...	93.9	2,040,083	27
0.7	11,088	2.0	40,092	...	...	12.4	203,909	...	...	84.1	1,664,982	103.7	1,188,070	...	...	28
127.0	2,491,522	0.3	6,160	...	...	...	...	...	...	8.1	143,510	...	...	...	...	29
108.6	1,914,693	6.3	137,392	...	...	...	...	...	...	14.3	144,760	...	...	...	...	30
0.6	11,534	(2)	531	...	...	1.2	18,506	...	...	55.1	881,414	132.3	2,095,632	...	...	31
2.0	35,200	2.5	51,333	...	...	...	...	...	...	...	...	...	...	53.0	1,088,267	32
23.0	495,081	...	...	...	...	...	...	0.6	8,839	...	...	...	...	...	...	33
6.7	146,831	0.9	18,999	...	...	0.9	17,510	...	...	66.3	1,171,230	...	...	...	...	34
6.6	123,686	...	...	...	...	...	...	...	...	...	...	...	...	...	...	35
7.8	137,207	1.0	19,244	...	...	...	...	...	...	69.2	1,462,334	...	...	...	...	36
37.3	723,107	...	...	3.6	97,773	0.2	2,972	...	...	4.5	63,454	...	...	...	...	37
...	...	...	...	...	...	0.3	5,458	...	...	*40.0*	*613,500*	*40.3*	*614,700*	...	...	38
7.8	187,616	...	...	...	...	2.2	51,022	...	...	...	...	93.2	2,132,891	0.7	14,414	39
0.1	2,278	...	...	...	...	...	...	...	...	1.3	30,391	71.1	1,416,054	...	...	40
...	...	0.6	15,840	...	...	...	...	1.3	26,500	214.9	4,413,100	...	...	...	...	41
22.8	534,735	0.5	10,949	0.2	5,597	1.3	30,460	...	...	7.4	176,527	147.9	2,602,631	...	...	42
2.0	35,376	...	...	...	...	...	...	...	...	163.6	2,847,060	...	...	...	...	43
0.2	3,116	0.3	4,506	...	...	0.4	9,832	1.0	15,834	34.6	615,105	74.9	1,308,592	5.3	63,842	44
3.6	82,941	0.2	5,512	...	...	0.8	22,329	...	...	84.7	1,220,526	...	...	...	...	45
27.9	616,855	...	...	...	...	...	...	...	...	0.9	19,105	...	...	...	...	46

---

[3] Includes Hudson County Boulevard: Length, 5.5 miles; area, 193,644 square yards.

TABLE 21.—HIGHWAYS—LENGTH AND AREA OF PRINCIPAL KINDS OF PAVED

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see

City number.	CITY.	DURABLE PAVEMENTS.											
		Sheet asphalt.		Block asphalt.		Bitulithic.		Tar-bound macadam.		Granite and Belgian block.		Cobblestone.	
		Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.												
47	Albany, N. Y	10.0	175,957	0.8	14,500					32.6	572,828	8.8	154,924
48	Bridgeport, Conn	1.8	36,240							1.6	27,717		
49	Spokane, Wash	11.6	363,646										
50	Hartford, Conn	8.4	199,000	0.6	18,700					0.6	14,570		
51	Reading, Pa	6.2	139,298							0.5	7,333	6.3	124,765
52	Trenton, N. J	14.7	287,039			0.5	5,704			3.4	75,205		
53	San Antonio, Tex	9.5	167,429										
54	New Bedford, Mass	0.4	11,406	0.5	6,511	2.9	45,234			6.9	99,056	11.8	144,521
55	Camden, N. J	25.1	378,605	3.1	45,298					19.3	283,994	3.0	49,771
56	Dallas, Tex	3.7	121,326			6.9	141,304						
57	Salt Lake City, Utah	19.9	736,081							0.5	26,133		
58	Lynn, Mass					1.9	54,920			4.0	85,490		
59	Wilmington, Del	1.0	15,934			4.1	95,917	0.1	24,963	11.9	212,324	10.4	187,364
60	Springfield, Mass	0.4	7,877			2.1	39,934			2.1	36,716		
61	Des Moines, Iowa	13.8	279,385					0.1	1,886				
62	Lawrence, Mass	0.3	6,707							6.7	155,767		
63	St. Joseph, Mo	12.2	247,732							1.4	31,799		
64	Troy, N. Y	6.0	122,107	0.2	2,508	0.8	14,790			25.0	400,290		
65	Yonkers, N. Y	6.9	143,717			0.5	7,125			2.7	48,578	0.1	1,333
66	Tacoma, Wash	34.9	728,396			2.2	70,723			6.5	158,944		
67	Youngstown, Ohio	11.5	210,322	6.1	107,028					0.4	16,227		
68	Duluth, Minn	1.4	38,280					9.4	164,560	2.6	59,488		
69	Houston, Tex	5.7	160,462							0.1	1,892		
70	Somerville, Mass	0.7	10,410			0.9	14,689	1.7	25,069	3.0	75,382		
71	Kansas City, Kans	15.2	398,863							0.2	5,608		
72	Utica, N. Y	58.8	1,044,143	0.1	887					5.3	110,752	0.7	13,593
73	Waterbury, Conn	0.1	3,488	(2)	253	2.3	48,364			2.5	52,514		
74	Elizabeth, N. J	3.6	76,031			0.5	10,560			21.1	450,203	0.1	2,323
75	Schenectady, N. Y	30.6	549,462	2.8	50,742					2.6	46,398	1.2	22,241
76	Hoboken, N. J	4.8	96,070							16.4	293,905		
77	Manchester, N. H							*2.5*	54,750	*3.5*	78,153		
78	Evansville, Ind	10.8	217,479					1.0	8,844				
79	Birmingham, Ala	0.3	5,352					10.2	258,745	2.0	55,691		
80	Akron, Ohio	0.4	4,001	3.0	52,915					2.7	53,001		
81	Norfolk, Va	21.6	427,864	1.3	26,164	0.9	17,952			20.0	332,190		
82	Fort Worth, Tex	3.2	55,548			1.4	23,355	0.1	2,816				
83	Wilkes-Barre, Pa	8.5	153,980							1.1	19,209	0.2	5,157
84	Erie, Pa	21.6	501,920	0.6	9,985							4.5	64,811
85	Savannah, Ga	7.3	140,814	4.2	80,869					4.4	84,206	6.8	130,759
86	Peoria, Ill	12.7	251,490							0.1	581	0.4	9,514
87	Harrisburg, Pa	38.1	720,920	0.4	1,414	0.1	2,009						
88	Fort Wayne, Ind	26.9	510,036	0.1	2,125								
89	Charleston, S. C	0.7	14,319							17.1	253,990	2.8	61,600
90	Portland, Me					2.2	42,198	16.5	264,082	13.7	266,954	0.7	13,895
91	Terre Haute, Ind	3.7	87,790										
92	East St. Louis, Ill									*3.7*	*77,510*		
93	Holyoke, Mass	0.6	12,746	0.5	11,470	0.7	14,524	3.8	67,058	2.7	54,655		
94	Brockton, Mass					1.9	29,713	2.0	24,228	7.9	151,917		
95	Johnstown, Pa											5.0	93,280
96	Jacksonville, Fla												
97	Oklahoma City, Okla	77.0	1,573,205										
98	Bayonne, N. J	5.1	126,833							2.8	62,250		
99	Covington, Ky	3.5	77,285										
100	South Bend, Ind	5.4	155,748					1.9	38,584				
101	Passaic, N. J	1.6	33,652							1.5	16,193		
102	Altoona, Pa	4.3	65,038	1.7	25,906					0.9	12,182	0.1	1,576
103	Mobile, Ala	5.4	86,882			3.0	46,015			1.5	29,745		
104	Allentown, Pa	13.0	252,065					1.2	26,038				
105	Pawtucket, R. I					3.5	61,512	0.2	1,847	5.4	91,691		

---

[1] Exclusive of roadways in parks.

[2] Owned by private corporation, but used by the public.

STREETS,[1] CLASSIFIED ACCORDING TO KIND OF SURFACE: 1909—Continued.

page 85. For a text discussion of this table, see page 65. Figures printed in italics are estimates.]

DURABLE PAVEMENTS—continued.								NONDURABLE PAVEMENTS.								City number.
Brick.		Creosoted wood block.		Untreated wood block.		Other.		Oil-bound macadam.		Water-bound macadam.		Water-bound gravel.		Other.		
Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	
GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.																
31.3	550,260									6.4	113,239					47
4.0	90,592	0.6	14,569							*72.7*	*1,279,520*					48
0.5	15,665													1.1	38,527	49
										95.0	*1,672,000*					50
14.2	284,237									51.8	1,517,828					51
9.8	186,460	0.1	1,223							10.9	154,633					52
0.4	7,490			1.0	28,811					*50.2*	*883,520*	104.0	2,251,000			53
0.3	9,276									75.0	940,443					54
2.6	38,105					12.9	188,687			4.0	61,889					55
4.0	80,954	0.1	514	5.6	129,043					47.3	837,258					56
						0.2	3,312			3.3	75,166					57
0.1	2,679					1.6	40,149			*18.3*	392,839					58
13.9	226,987					1.8	42,966			19.7	287,595					59
4.5	86,140	1.8	46,738							65.9	1,205,564	80.7	1,420,144			60
55.9	1,118,710	1.5	34,491							0.1	1,714	0.1	2,966	0.5	6,763	61
[3] 0.4	[3] 9,778									26.0	461,711					62
30.9	569,620					3.1	62,767			28.2	493,668					63
16.7	278,454					0.9	15,467			3.0	53,543					64
0.3	6,395									88.1	1,292,000					65
5.6	171,233			0.1	1,867	0.3	3,173			0.3	6,172					66
27.1	478,408									0.9	15,227					67
1.5	41,392	0.7	17,486	10.0	316,800	0.8	11,327			29.7	783,285	57.5	1,368,255			68
16.0	342,714			1.8	49,883					2.1	36,948	44.4	607,418	5.2	66,923	69
0.2	5,640					1.8	36,802	6.0	91,520	66.1	791,413					70
49.7	968,753									1.9	33,183					71
0.8	13,355	0.1	1,849							0.9	9,596					72
4.2	88,586									*7.0*	*122,850*					73
1.3	32,716	4.6	96,940							19.1	278,805					74
10.7	192,131									2.0	34,949					75
		0.2	2,646							0.7	12,264					76
		0.1	2,873			0.1	1,636	*0.5*	*7,920*	*30.0*	*475,200*					77
27.9	645,874							0.7	13,200	3.5	82,133	4.0	71,800			78
5.7	188,546									65.0	1,454,397					79
43.1	785,312									6.8	107,087					80
2.0	32,858	0.2	2,000							1.4	24,542			12.0	158,000	81
2.2	76,384											75.0	1,320,000			82
18.0	270,487									0.1	983					83
14.0	318,861			0.4	878											84
17.8	342,519									0.7	14,912	1.4	27,388	2.4	46,539	85
44.6	880,188									1.0	17,264					86
2.9	36,648	0.2	3,006							10.0	186,000					87
17.6	335,479															88
4.6	82,433									4.6	81,026	5.5	69,610	2.1	39,406	89
0.2	4,084					1.0	15,225					*85.1*	*1,645,562*			90
19.8	404,888	0.6	12,672							2.5	58,666	55.5	1,202,300			91
41.5	*876,480*									*3.0*	*63,360*					92
2.1	41,489	0.8	15,230							9.5	167,376	25.7	451,264			93
										20.5	282,065					94
18.0	316,800															95
35.3	724,827									4.3	75,152			18.7	329,120	96
1.4	58,700									0.8	11,440					97
1.3	25,196	0.1	11,528							[4] 11.0	[4] 300,713					98
13.7	234,891									38.8	614,592					99
41.9	872,663	0.1	1,236	0.2	1,524					0.9	14,836	1.4	40,993			100
0.2	4,925									31.5	498,960					101
21.2	312,818									0.6	10,000					102
4.7	73,652	3.6	57,646			0.7	10,000					4.0	108,000			103
0.3	36,974									8.8	135,880					104
0.1	1,965									20.1	329,519	64.3	1,067,713			105

[3] Less than one-tenth of 1 mile.

[4] Includes Hudson County Boulevard: Length, 3.8 miles; area, 135,200 square yards.

TABLE 21.—HIGHWAYS—LENGTH AND AREA OF PRINCIPAL KINDS OF PAVED

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see

City number.	CITY.	DURABLE PAVEMENTS.											
		Sheet asphalt.		Block asphalt.		Bitulithic.		Tar-bound macadam.		Granite and Belgian block.		Cobblestone.	
		Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.												
106	Saginaw, Mich	23.6	477,121			1.1	17,218					0.2	4,972
107	Canton, Ohio												
108	Wichita, Kans	12.5	310,067			1.3	37,557						
109	Springfield, Ill	4.5	78,894										
110	Binghamton, N. Y	2.2	49,796										
111	Lancaster, Pa			1.0	19,477					1.8	30,314		
112	Sioux City, Iowa	9.4	264,757										
113	Little Rock, Ark	5.3	100,480							0.7	16,896		
114	Springfield, Ohio	0.8	18,624	0.9	20,848					0.6	15,165		
115	Atlantic City, N. J	2.6	48,925			7.3	164,078						
116	Bay City, Mich	7.5	135,455			1.5	7,700						
117	Rockford, Ill	1.8	51,520										
118	York, Pa	2.5	45,000										
119	Lincoln, Nebr	12.8	212,465										
120	Chattanooga, Tenn	3.3	79,899	1.0	20,339					2.1	57,297		
121	Topeka, Kans	6.5	186,814							3.1	58,115		
122	Sacramento, Cal	7.3	192,985					1.8	53,504	0.5	14,080		
123	Malden, Mass									1.0	23,576		
124	Haverhill, Mass							3.1	33,828	4.2	91,056		
125	Pueblo, Colo	3.2	102,631			1.2	38,887						
126	Salem, Mass					*0.7*	*18,864*			*4.6*	*87,740*		
127	New Britain, Conn					0.2	3,580						
128	Davenport, Iowa	9.4	190,385					0.1	907				
129	McKeesport, Pa									5.6	92,400		
130	Wheeling, W. Va			0.2	3,887					0.1	933	3.4	58,905
131	Augusta, Ga									2.4	50,390		
132	Superior, Wis	0.4	10,090			1.8	51,240	1.0	23,466	0.4	9,755		
133	Newton, Mass							25.0	692,266				
134	Dubuque, Iowa												
135	Butte, Mont									2.7	78,482		
136	Chester, Pa	9.7	173,598			4.2	73,920					1.2	21,120
137	Kalamazoo, Mich	3.7	61,709	1.2	21,093	1.5	43,531						
138	Montgomery, Ala	(2)	85,027			(2)	7,521	(2)	1,508	(2)	78,155		
139	Woonsocket, R. I					0.7	11,767	(2)	498	0.9	15,532	(2)	600
140	Galveston, Tex												
141	Fitchburg, Mass							0.8	9,052	6.0	121,262	0.4	5,971
142	Racine, Wis	2.9	51,308							(2)	1,812		
143	Elmira, N. Y	4.6	104,814					0.6	11,789	1.4	*29,634*		
144	Quincy, Ill												
145	Knoxville, Tenn	10.9	200,795			2.3	51,405	(2)	235				
146	New Castle, Pa.			9.0	148,007								
147	Macon, Ga	0.2	6,000							2.2	42,467		
148	Auburn, N. Y	4.5	109,272			1.3	26,951						
149	West Hoboken, N. J	0.8	14,256			0.9	19,400			9.6	169,488		
150	Joliet, Ill	7.9	173,623										
151	Taunton, Mass					1.1	15,839	0.7	1,925	4.9	71,651	0.1	1,584
152	Everett, Mass					0.4	2,066			1.3	18,257		
153	Oshkosh, Wis	3.7	69,461					4.0	70,576				
154	Chelsea, Mass									*5.1*	*90,410*		
155	Joplin, Mo	0.2	3,592										
156	La Crosse, Wis												
157	Newport, Ky	0.4	6,509			0.1	2,000						
158	South Omaha, Nebr	0.3	7,500							1.2	38,621		

---

[1] Exclusive of roadways in parks.

[2] Less than one-tenth of 1 mile.

STREETS,[1] CLASSIFIED ACCORDING TO KIND OF SURFACE: 1909—Continued.

page 85. For a text discussion of this table, see page 65. Figures printed in italics are estimates.]

DURABLE PAVEMENTS—continued.								NONDURABLE PAVEMENTS.								City number.
Brick.		Creosoted wood block.		Untreated wood block.		Other.		Oil-bound macadam.		Water-bound macadam.		Water-bound gravel.		Other.		
Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards)..	Length (miles).	Area (square yards).	
GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.																
12.0	245,552			6.1	113,717	0.5	8,846			22.2	371,824					106
23.9	537,631															107
4.8	116,218									0.5	6,393					108
46.0	1,077,431			0.2	4,343	0.2	3,687			1.5	38,870					109
10.4	229,556									5.0	88,000					110
6.1	109,201									40.5	728,716					111
6.4	158.413	0.7	16,122													112
9.9	185,504									15.0	283.220					113
10.6	248,469	(2)	3,807							17.1	376,260	48.5	1,138.150			114
6.6	199,275	0.4	3,767							25.1	388,117	16.0	281,600			115
18.7	391,042			7.8	112,511					3.7	32,835					116
2.2	51,387									56.9	1,135.139					117
3.0	53,000									25.0	450,000					118
21.2	561,229			1.1	28,405											119
6.8	121,546	0.1	1,461							3.3	34,407			18.4	224,189	120
40.0	704,704			0.6	1,423					2.0	9.387					121
								25.5	716,389			19.6	552,501			122
0.1	1,666									*6.7*	176,315	*53.6*	*1,100,587*			123
						0.7	7,862			16.8	230,905					124
										1.1	19,507					125
										24.9	*478,660*			*23.2*	*380,000*	126
										22.6	*397,760*					127
39.8	979,181	0.1	1,265							0.7	7,931					128
25.5	358,289									0.6	10,000					129
25.7	450,154									1.5	26,048	2.4	54,667			130
3.6	115,469									28.0	594,497	26.8	503,233			131
0.4	9,150	0.5	10,894	28.1	793,213					17.2	403,380					132
										65.9	1,616.854	51.0	1,196.800			133
8.4	160,520									72.2	1,061,271					134
0.6	15,115															135
3.5	60,474									3.3	52,800			3.1	55,260	136
9.2	223,689					0.2	5,660			0.3	7,466					137
(2)	162,677											(2)	103.003			138
0.6	10,335	0.1	2,090							15.3	197,472	30.5	393,653			139
5.4	112,390	2.1	58,626											32.0	657,056	140
										14.1	147,448					141
16.2	311,634			1.1	20,681					2.7	62,054					142
4.5	102,910									5.2	73,626	41.8	613.937			143
27.6	612,200									12.7	223,520					144
4.0	85,786					3.3	57,728			57.5	1,015,889					145
13.4	213,921									0.5	8,800					146
3.5	43.989															147
1.1	33.886									*38.0*	*624,213*					148
3.7	64.416									2.9	*67,584*					149
3.6	88,758									13.8	280,760	6.3	126,706			150
						0.3	5,428			24.0	357,682	65.1	802,032			151
0.1	3,056									27.2	383.539	9.8	137,984			152
2.5	57,493	0.4	9,469	5.0	105,811					14.1	265,080	21.6	380,512			153
1.3	*22,468*									*20.9*	*368,972*	*10.0*	*176,000*			154
4.3	105,325	0.2	2,888							55.9	890,138	5.0	88,000			155
7.3	150.793	0.7	11,146							32.4	592,034					156
7.4	153,386									19.4	397,320					157
9.1	271,280															158

---

[2] Not reported.

TABLE 22.—HIGHWAYS—AREA (SQUARE YARDS) OF PRINCIPAL CLASSES OF STREET[1] PAVEMENTS LAID BY CONTRACTORS AND BY CITY EMPLOYEES DURING THE YEAR: 1909.

[Cities that laid no pavements in 1909 are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 70. Figures printed in italics are estimates.]

City number.	CITY.	ALL PAVEMENTS.			DURABLE PAVEMENTS.									NONDURABLE PAVEMENTS.		
		Total.	By contractors.	By city employees.	Total.	Sheet asphalt.		Granite and Belgian block.		Brick.		Other.		Total.	By contractors.	By city employees.
						By contractors.	By city employees.	By contractors.	By city employees.	By contractors.	By city employees.	By contractors.	By city employees.			
	Grand total....	22,178,095	18,462,804	3,715,291	16,585,675	6,884,588	236,663	1,443,579	243,983	4,363,395	273,807	2,216,564	923,096	5,592,420	3,554,678	2,037,742
	Group I............	9,498,400	8,058,948	1,439,452	7,969,542	3,397,243	236,148	982,299	59,145	1,621,741	193,942	1,257,749	221,275	1,528,858	799,916	728,942
	Group II............	6,016,919	4,648,327	768,592	3,413,536	1,438,587	....	230,042	90,759	889,012	10,203	559,944	194,989	2,003,383	1,530,742	472,641
	Group III............	4,072,868	3,198,933	873,935	3,040,923	1,416,060	515	194,269	65,733	829,035	59,978	261,307	214,026	1,031,945	498,262	533,683
	Group IV............	3,189,908	2,556,596	633,312	2,161,674	632,698	....	36,969	28,346	1,023,607	9,684	137,564	292,806	1,028,234	725,758	302,476
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.															
1	New York, N. Y....	1,712,873	1,582,903	129,970	1,503,776	838,477	....	189,891	....	....	....	475,408	....	209,097	79,127	129,970
2	Chicago, Ill.........	1,882,470	1,882,470	....	1,545,744	1,005,713	....	245,428	....	219,081	....	75,522	....	336,726	336,726	....
3	Philadelphia, Pa....	493,161	493,161	....	416,619	235,347	....	38,770	....	87,502	....	55,000	....	76,542	76,542	....
4	St. Louis, Mo........	841,801	841,801	....	822,582	39,792	....	92,973	....	580,238	....	109,579	....	19,219	19,219	....
5	Boston, Mass........	832,258	168,527	663,731	197,923	19,173	....	45,621	55,525	17,842	....	8,401	51,361	634,335	77,490	556,845
6	Baltimore, Md.......	293,223	283,830	9,393	293,223	91,332	....	64,049	252	37,787	9,141	90,662	....	....	....	....
7	Cleveland, Ohio.....	411,308	411,308	....	411,308	3,530	....	16,295	....	387,905	....	3,578	....	....	....	....
8	Pittsburgh, Pa.......	191,551	191,551	....	191,551	67,586	....	68,416	....	50,182	....	5,367	....	....	....	....
9	Detroit, Mich.........	629,918	276,065	353,853	629,918	51,932	188,643	....	2,911	36,947	154,290	187,186	8,009	....		
10	Buffalo, N. Y.........	125,195	125,195	....	108,451	70,651	....	27,783	....	10,017	....	....	....	16,744	16,744	....
11	San Francisco, Cal...	326,517	326,517	....	285,927	243,115	....	3,234	....	....	....	39,578	....	40,590	40,590	....
12	Cincinnati, Ohio.....	418,463	178,085	240,378	383,263	46,992	47,505	45,090	457	27,923	30,511	22,880	161,905	35,200	35,200	....
13	Milwaukee, Wis......	310,504	310,504	....	249,209	125,991	....	17,698	....	92,683	....	12,837	....	61,295	61,295	....
14	Newark, N. J.........	161,506	161,506	....	125,720	2,775	....	20,635	....	70,896	....	31,414	....	35,786	35,786	....
15	New Orleans, La....	567,558	567,558	....	546,361	325,793	....	91,579	....	2,738	....	126,251	....	21,197	21,197	....
16	Washington, D. C...	300,094	257,967	42,127	257,967	229,044	....	14,837	....	....	....	14,086	....	42,127	....	42,127
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.															
17	Minneapolis, Minn...	237,498	34,693	202,805	199,137	....	....	34,693	13,029	....	8,077	....	143,338	38,361	....	38,361
18	Los Angeles, Cal.....	8,629	8,629	....	3,100	2,130	....	74	....	896	....	....	....	5,529	5,529	....
19	Jersey City, N. J.....	86,976	86,976	....	82,878	11,945	....	41,795	....	354	....	28,784	....	4,098	4,098	....
20	Kansas City, Mo.....	303,608	303,608	....	231,921	206,657	....	22,494	....	2,770	....	....	....	71,687	71,687	....
21	Indianapolis, Ind ...	175,037	175,037	....	157,214	60,667	....	....	....	76,406	....	20,141	....	17,823	17,823	....
22	Louisville, Ky	26,047	26,047	....	22,427	19,048	....	946	....	2,433	....	....	....	3,620	3,620	....
23	Seattle, Wash........	666,151	666,151	....	666,151	416,416	....	26,382	....	75,513	....	147,840	....	....	....	....
24	Providence, R. I.....	47,135	....	47,135	7,078	....	....	....	6,627	....	451	....	....	40,057	....	40,057
25	Rochester, N. Y.....	201,506	201,506	....	175,147	100,315	....	24,610	....	50,222	....	....	....	26,359	26,359	....
26	St. Paul, Minn......	765,584	87,674	77,910	35,869	9,895	....	16,334	....	....	....	....	9,640	129,715	61,445	68,270
27	Denver, Colo.........	(2)	....	(2)	....	....	....	....	....	....	....	....	....	(2)	....	(2)
28	Portland, Oreg......	816,680	816,680	....	400,800	100,022	....	39,098	....	....	....	261,680	....	415,880	415,880	....
29	Columbus, Ohio.....	335,751	335,751	....	320,731	75,475	....	....	....	245,256	....	....	....	15,020	15,020	....
30	Toledo, Ohio.........	148,350	148,350	....	148,350	44,678	....	....	....	80,672	....	23,000	....	....	....	....
31	Worcester, Mass.....	126,317	....	126,317	74,054	....	....	....	30,368	....	1,675	....	42,011	52,263	....	52,263
32	Atlanta, Ga..........	54,116	....	54,116	....	....	....	....	....	....	....	....	....	54,116	....	54,116
33	Syracuse, N. Y......	76,660	76,660	....	67,821	45,507	....	1,389	....	20,925	....	....	....	8,839	8,839	....
34	New Haven, Conn...	11,332	11,332	....	2,957	....	....	1,964	....	....	....	993	....	8,375	8,375	....
35	Scranton, Pa.........	83,608	83,608	....	83,608	68,044	....	2,914	....	12,650	....	....	....	....	....	....
36	Paterson, N. J........	30,698	30,698	....	30,698	12,205	....	....	....	....	....	18,493	....	....	....	....
37	Omaha, Nebr.........	172,602	172,602	....	172,602	68,904	....	....	....	102,086	....	1,612	....	....	....	....
38	Fall River, Mass.....	33,362	4,186	29,176	16,510	2,481	....	....	12,324	....	....	1,705	....	*16,852*	....	*16,852*
39	Memphis, Tenn.......	577,489	552,321	25,168	284,854	155,478	....	....	....	110,140	....	19,236	....	292,635	267,467	25,168
40	Richmond, Va.......	172,874	116,144	56,730	32,512	....	....	17,349	....	....	....	15,163	....	140,362	83,632	56,730
41	Oakland, Cal.........	455,595	455,595	....	42,054	38,720	....	....	....	....	....	3,334	....	413,541	413,541	....
42	Grand Rapids, Mich.	142,534	142,534	....	101,156	....	....	....	....	98,494	....	2,662	....	41,378	41,378	....
43	Nashville, Tenn.....	121,985	86,919	35,066	870	....	....	....	....	870	....	....	....	121,115	86,049	35,066
44	Lowell, Mass.........	100,042	....	100,042	20,296	....	....	....	20,296	....	....	....	....	79,746	....	79,746
45	Cambridge, Mass....	29,428	15,301	14,127	23,416	....	....	....	8,115	....	....	15,301	....	6,012	....	6,012
46	Dayton, Ohio.........	9,325	9,325	....	9,325	....	....	....	....	9,325	....	....	....	....	....	....

---

[1] Exclusive of roadways in parks.

[2] Not reported.

TABLE 22.—HIGHWAYS—AREA (SQUARE YARDS) OF PRINCIPAL CLASSES OF STREET[1] PAVEMENTS LAID BY CONTRACTORS AND BY CITY EMPLOYEES DURING THE YEAR: 1909—Continued.

[Cities that laid no pavements in 1909 are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 70. Figures printed in italics are estimates.]

City number.	CITY.	ALL PAVEMENTS.			DURABLE PAVEMENTS.									NONDURABLE PAVEMENTS.		
		Total.	By contractors.	By city employees.	Total.	Sheet asphalt.		Granite and Belgian block.		Brick.		Other.		Total.	By contractors.	By city employees.
						By contractors.	By city employees.	By contractors.	By city employees.	By contractors.	By city employees.	By contractors.	By city employees.			
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.															
47	Albany, N. Y	59,679	59,679		59,679	2,863				56,816						
48	Bridgeport, Conn	31,440		31,440	6,440						5,566		874	*25,000*		*25,000*
49	Spokane, Wash	83,898	83,898		46,237	44,897				1,340				37,661	37,661	
50	Hartford, Conn	65,497	25,497	40,000	18,457	16,699		1,758						47,040	7,040	40,000
52	Trenton, N. J	34,525	34,525		28,175	22,247				224		5,704		6,350	6,350	
53	San Antonio, Tex	146,923	27,691	119,232	27,691	27,691								119,232		119,232
54	New Bedford, Mass	68,015		68,015	12,531		515		12,016					55,484		55,484
55	Camden, N. J	68,347	68,347		65,125	20,226		43,461		1,438				3,222	3,222	
56	Dallas, Tex	159,403	159,403		57,953					25,519		32,434		101,450	101,450	
57	Salt Lake City, Utah	119,134	119,134		119,134	117,522						1,612				
58	Lynn, Mass	146,016	10,102	135,914	10,773				671			10,102		135,243		135,243
59	Wilmington, Del	76,951		76,951	74,668				4,267				70,401	2,283		2,283
60	Springfield, Mass	69,514	552	68,962	13,932				949			552	12,431	55,582		55,582
61	Des Moines, Iowa	117,409	117,409		110,646	44,302				52,732		13,612		6,763	6,763	
62	Lawrence, Mass	65,735	47,356	18,379	60,120			47,356	12,764					5,615		5,615
63	St. Joseph, Mo	98,207	98,207		93,037	953		1,272		43,160		47,652		5,170	5,170	
64	Troy, N. Y	20,300	20,300		20,300					10,864		9,436				
65	Yonkers, N. Y	35,625	35,625											35,625	35,625	
66	Tacoma, Wash	247,622	247,622		241,450	182,286		26,164		29,827		3,173		6,172	6,172	
67	Youngstown, Ohio	151,058	151,058		151,058	6,404		2,559		136,905		5,190				
68	Duluth, Minn	36,340	36,340		36,340							36,340				
69	Houston, Tex	108,601	12,852	95,749	46,784						46,784			61,817	12,852	48,965
70	Somerville, Mass	31,908	4,292	27,616	31,908			4,292	2,547				[2] 25,069			
71	Kansas City, Kans	36,836	36,836		36,836	28,643				8,193						
72	Utica, N. Y	48,628	48,628		48,628	46,312				2,316						
73	Waterbury, Conn	32,775	32,775		27,438			4,923		22,120		395		5,337	5,337	
74	Elizabeth, N. J	22,656	22,656		22,656			12,106		10,550						
75	Schenectady, N. Y	83,430	83,430		83,430	45,624		11,224		24,391		2,191				
76	Hoboken, N. J	2,646	2,646		2,646							2,646				
77	Manchester, N. H	7,947	7,947		7,947			5,116				2,831				
78	Evansville, Ind	79,780	79,780		66,580	31,887				34,693				13,200	13,200	
79	Birmingham, Ala	19,017	19,017		1,417					1,417				17,600	17,600	
80	Akron, Ohio	*95,000*	*95,000*		*95,000*			*11,000*		*80,000*		*4,000*				
81	Norfolk, Va	18,000	13,000	5,000	18,000			11,000	5,000			2,000				
82	Fort Worth, Tex	227,920	227,920		7,920	7,920								220,000	220,000	
83	Wilkes-Barre, Pa	32,894	32,894		31,911	7,616				24,295				983	983	
84	Erie, Pa	108,190	108,190		108,190	108,190										
85	Savannah, Ga	50,567		50,567	48,234				2,354		6,988		38,892	2,333		2,333
86	Peoria, Ill	34,288	34,288		34,288					34,288						
87	Harrisburg, Pa	66,832	66,832		66,832	58,181				8,651						
88	Fort Wayne, Ind	23,700	23,700		23,700	20,158				3,542						
89	Charleston, S. C	39,089	21,637	17,452	33,382				11,745	21,637				5,707		5,707
90	Portland, Me	39,667	14,138	25,529	39,667				3,756		640	14,138	21,133			
92	East St. Louis, Ill	*12,038*	*12,038*		12,038			*12,038*		(3)				(3)		(3)
93	Holyoke, Mass	29,924		29,924	20,596				1,445				19,151	9,328		9,328
94	Brockton, Mass	31,571		31,571	31,571				7,343				24,228			
96	Jacksonville, Fla	82,133	82,133		82,133					82,133						
97	Oklahoma City, Okla	476,808	476,808		476,808	471,308				5,500						
98	Bayonne, N. J	43,138	43,138		36,421	30,771				5,650				6,717	6,717	
99	Covington, Ky	22,346	22,346		10,226					10,226				12,120	12,120	
100	South Bend, Ind	47,412	47,412		47,412	8,774				799		37,839				
102	Altoona, Pa	76,708	76,708		76,708					76,708						
103	Mobile, Ala	33,160	33,160		33,160					3,700		29,460				
104	Allentown, Pa	73,987	73,987		73,987	64,586				9,401						
105	Pawtucket, R. I	31,634		31,634	2,723				876				1,847	28,911		28,911

---

[1] Exclusive of roadways in parks.

[2] Base laid by contract, surface laid by city.

[3] Not reported.

TABLE 22.—HIGHWAYS—AREA (SQUARE YARDS) OF PRINCIPAL CLASSES OF STREET[1] PAVEMENTS LAID BY CONTRACTORS AND BY CITY EMPLOYEES DURING THE YEAR: 1909—Continued.

[Cities that laid no pavements in 1909 are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 25. For a text discussion of this table, see page 70. Figures printed in italics are estimates.]

City number.	CITY.	ALL PAVEMENTS.			DURABLE PAVEMENTS.									NONDURABLE PAVEMENTS.		
		Total.	By contractors.	By city employees.	Total.	Sheet asphalt.		Granite and Belgian block.		Brick.		Other.		Total.	By contractors.	By city employees.
						By contractors.	By city employees.	By contractors.	By city employees.	By contractors.	By city employees.	By contractors.	By city employees.			
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.															
106	Saginaw, Mich.	59,673	59,673		59,673	45,898				13,775						
107	Canton, Ohio	143,740	143,740		143,740					143,740						
108	Wichita, Kans.	199,488	199,488		199,488	135,782				45,370		18,336				
109	Springfield, Ill.	106,541	106,541		106,541	13,740				92,801						
110	Binghamton, N. Y.	12,748	12,748		12,748					12,748						
111	Lancaster, Pa.	24,857	24,857		11,025			7,783		3,242				13,832	13,832	
112	Sioux City, Iowa	14,412	14,412		14,412	14,412										
113	Little Rock, Ark.	105,977	105,977		105,977	21,600				84,377						
114	Springfield, Ohio	28,521	28,521		26,186					11,746		14,440		2,335	2,335	
115	Atlantic City, N. J.	100,830	100,830		83,078					23,904		59,174		17,752	17,752	
116	Bay City, Mich.	81,371	81,371		81,371	45,854				35,517						
117	Rockford, Ill.	68,737	68,737		28,733	26,140				2,593				40,004	40,004	
118	York, Pa.	27,000	27,000		27,000	27,000										
119	Lincoln, Nebr.	29,319	29,319		29,319					29,319						
120	Chattanooga, Tenn.	85,398	85,398		45,638	18,904				26,734				39,760	39,760	
121	Topeka, Kans.	77,721	77,721		77,721					77,721						
122	Sacramento, Cal.	303,406	303,406		31,945	31,945								271,461	271,461	
124	Haverhill, Mass.	53,129	7,862	45,267	43,868				2,178			7,862	33,828	9,261		9,261
126	Salem, Mass.	30,886		30,886	1,000				1,000					29,886		29,886
127	New Britain, Conn.	*37,074*		*37,074*										*37,074*		*37,074*
128	Davenport, Iowa	104,498	104,498		104,498	31,140				73,358						
129	McKeesport, Pa.	32,497	32,497		32,497					32,497						
130	Wheeling, W. Va.	21,849	21,849		21,849					17,962		3,887				
131	Augusta, Ga.	140,593	16,906	123,687	16,906					16,906				*123,687*		*123,687*
132	Superior, Wis.	57,961	57,961											57,961	57,961	
133	Newton, Mass.	252,067		252,067	252,067								252,067			
134	Dubuque, Iowa	36,001	36,001		9,364					9,364				26,637	26,637	
135	Butte, Mont.	21,170	21,170		21,170			6,055		15,115						
136	Chester, Pa.	15,635	15,635		15,635	8,156				7,479						
137	Kalamazoo, Mich.	27,566	27,566		27,566	19,121				8,445						
138	Montgomery, Ala.	101,861	101,861		78,455	53,475		20,131		1,066		3,783		23,406	23,406	
139	Woonsocket, R. I.	1,814	414	1,400	414					414				1,400		1,400
140	Galveston, Tex.	174,600	174,600		11,800					11,800				162,800	162,800	
141	Fitchburg, Mass.	17,463		17,463	17,463				10,552				6,911			
142	Racine, Wis.	63,199	63,199		58,337	20,680				37,166		491		4,862	4,862	
143	Elmira, N. Y.	20,078	20,078		20,078					20,078						
144	Quincy, Ill.	42,570	42,570		42,570					42,570						
145	Knoxville, Tenn.	138,035	113,535	24,500	113,535	104,732				8,568		235		24,500		24,500
146	New Castle, Pa.	10,678	10,678		10,678					10,678						
147	Macon, Ga.	18,899	18,899		18,899					18,899						
148	Auburn, N. Y.	*70,568*	4,861	*65,707*	4,861	3,028				1,833				*65,707*		*65,707*
149	West Hoboken, N. J.	32,400	32,400		32,400			3,000		10,000		19,400				
150	Joliet, Ill.	8,615	8,615		7,024	1,755				5,269				1,591	1,591	
151	Taunton, Mass.	14,542		14,542	4,301				4,301					10,241		10,241
152	Everett, Mass.	12,721		12,721	12,721				9,665		3,056					
153	Oshkosh, Wis.	10,558	10,558		10,558					602		9,956				
154	Chelsea, Mass.	7,998		7,998	7,278				650		6,628			720		720
155	Joplin, Mo.	47,929	47,929		1,427					1,427				46,502	46,502	
156	La Crosse, Wis.	24,073	24,073		7,218					7,218				16,855	16,855	
157	Newport, Ky.	11,642	11,642		11,642	1,836				9,806						
158	South Omaha, Nebr.	59,000	59,000		59,000	7,500				51,500						

---

[1] Exclusive of roadways in parks.

TABLE 23.—HIGHWAYS—AREA (SQUARE YARDS) OF SHEET-ASPHALT PAVEMENTS IN SPECIFIED CITIES AT THE CLOSE OF THE YEAR, CLASSIFIED ACCORDING TO THE YEAR IN WHICH LAID: 1909.

[Cities for which no complete record by years was obtained are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 72.]

City number.	CITY.	PAVEMENT LAID—											
		In all years.	Prior to 1900	In 1900	In 1901	In 1902	In 1903	In 1904	In 1905	In 1906	In 1907	In 1908	In 1909
	Grand total......	60,396,394	22,727,644	3,223,427	2,627,429	2,312,769	4,189,185	3,916,438	4,238,855	3,759,158	4,082,267	4,703,244	4,615,978
	Group I..............	41,864,965	15,956,981	2,374,402	1,713,064	1,668,935	3,155,871	2,749,671	3,205,434	2,529,966	2,298,644	3,109,785	3,102,202
	Group II..............	8,065,755	3,919,079	218,561	275,552	286,220	308,699	347,265	304,233	421,274	802,476	738,357	444,039
	Group III..............	7,529,184	2,129,284	528,185	555,704	293,255	491,538	672,374	548,929	512,528	659,659	561,259	576,469
	Group IV..............	2,936,500	722,300	102,279	83,109	64,359	233,077	147,128	189,259	295,390	321,488	293,843	493,268

GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.

City number.	CITY.	In all years.	Prior to 1900	In 1900	In 1901	In 1902	In 1903	In 1904	In 1905	In 1906	In 1907	In 1908	In 1909
1	New York, N. Y.......	[1] 13,445,867	3,876,972	601,651	639,300	682,062	1,811,623	1,226,992	1,245,708	859,240	556,940	1,106,902	838,477
2	Chicago, Ill..........	7,496,800	1,016,480	438,720	106,400	359,200	779,360	670,240	776,000	832,960	906,560	605,167	1,005,713
3	Philadelphia, Pa.......	7,031,225	3,713,263	461,843	481,707	253,089	257,041	162,989	238,276	182,170	339,015	706,965	235,347
4	St. Louis, Mo..........	1,279,685	267,931	32,232	5,649	7,923	105,782	283,356	109,059	203,640	68,620	155,701	39,792
5	Boston, Mass...........	319,445	124,753	16,539	73,840	7,420	3,453	10,182	7,890	5,556	45,983	4,656	19,173
6	Baltimore, Md.........	346,282	145,646	....	45,030	11,948	7,398	....	....	6,458	14,162	24,308	91,332
7	Cleveland, Ohio........	443,651	209,339	18,474	16,820	31,270	18,640	....	122,376	1,542	21,660	....	3,530
9	Detroit, Mich..........	1,350,115	503,397	43,452	27,124	36,788	40,289	57,667	116,978	152,989	45,380	85,476	240,575
10	Buffalo, N. Y..........	4,535,488	3,608,035	293,015	40,808	85,210	26,294	70,318	83,515	56,075	90,690	115,877	70,651
14	Newark, N. J..........	1,040,917	605,201	247,226	111,576	69,138	1,432	....	3,569	....	....	....	2,775
15	New Orleans, La.......	1,630,983	143,919	124,250	53,845	19,554	9,908	179,405	408,789	111,955	105,286	148,229	325,793
16	Washington, D. C......	[2] 2,944,547	1,747,025	97,500	110,965	105,333	94,651	88,522	93,274	117,281	104,348	156,504	229,044

GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.

City number.	CITY.	In all years.	Prior to 1900	In 1900	In 1901	In 1902	In 1903	In 1904	In 1905	In 1906	In 1907	In 1908	In 1909
17	Minneapolis, Minn.....	163,753	47,300	3,178	1,687	....	....	....	....	111,588	....	....	....
18	Los Angeles, Cal.......	1,239,040	129,105	....	11,147	38,887	5,185	121,846	133,512	105,565	322,294	369,360	2,130
19	Jersey City, N. J.......	459,060	251,625	45,586	18,730	11,920	12,065	8,149	10,307	36,814	17,997	33,922	11,945
21	Indianapolis, Ind......	1,319,534	926,169	10,825	32,948	5,403	49,530	62,439	5,176	21,671	107,635	37,071	66,667
24	Providence, R. I.......	90,055	80,727	352	....	....	5,280	2,816	176	....	352	352	....
25	Rochester, N. Y........	[3] 1,063,052	640,273	38,304	23,232	22,133	49,905	40,309	28,632	46,010	52,973	20,966	100,315
26	St. Paul, Minn.........	[4] 643,701	192,035	40,154	51,785	100,892	105,380	41,230	25,888	11,112	46,187	19,143	9,895
28	Portland, Oreg.........	397,738	59,633	....	....	1,235	47,402	11,707	....	....	62,500	115,239	100,022
29	Columbus, Ohio........	498,270	266,444	....	8,830	5,288	5,172	16,756	4,140	15,694	64,628	35,843	75,475
31	Worcester, Mass........	12,698	7,820	....	....	4,878	....	....	....	....	....	....	....
32	Atlanta, Ga............	167,895	12,991	12,577	32,162	34,417	22,982	10,402	4,091	....	38,273	....	....
34	New Haven, Conn.....	69,329	66,681	....	2,648	....	....	....	....	....	....	....	....
36	Paterson, N. J	124,946	38,609	....	30,058	....	....	....	31,281	....	....	12,793	12,205
37	Omaha, Nebr..........	1,130,932	682,688	48,179	37,509	23,967	5,798	24,219	52,602	43,230	51,812	92,024	68,904
38	Fall River, Mass.......	7,621	700	....	....	....	....	....	....	....	4,440	....	2,481
40	Richmond, Va.........	7,153	7,153	....	....	....	....	....	....	....	....	....	....
42	Grand Rapids, Mich...	147,523	101,690	16,027	5,397	8,589	....	7,392	8,428	....	....	....	....
44	Lowell, Mass...........	76,780	35,191	3,379	17,929	11,961	....	....	....	8,320	....	....	....
46	Dayton, Ohio..........	446,675	372,245	....	1,490	16,650	....	....	....	21,270	33,385	1,035	....

[1] The areas reported are exclusive of 292,104 square yards between street car tracks.
[2] The areas reported are exclusive of 425,000 square yards between street car tracks.
[3] The areas reported are exclusive of 2,397 square yards between street car tracks.
[4] The areas reported are exclusive of 33,327 square yards between street car tracks.

Table 23.—HIGHWAYS—AREA (SQUARE YARDS) OF SHEET-ASPHALT PAVEMENTS IN SPECIFIED CITIES AT THE CLOSE OF THE YEAR, CLASSIFIED ACCORDING TO THE YEAR IN WHICH LAID: 1909—Continued.

[Cities for which no complete record by years was obtained are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 72.]

City number.	CITY.	PAVEMENT LAID—											
		In all years.	Prior to 1900	In 1900	In 1901	In 1902	In 1903	In 1904	In 1905	In 1906	In 1907	In 1908	In 1909
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.												
47	Albany, N. Y	175,957	110,647	...	3,624	...	...	5,337	21,881	...	31,605	...	2,863
48	Bridgeport, Conn	36,240	36,240	...	...	...	...	...	...	...	...	...	...
49	Spokane, Wash	363,646	52,437	55,889	15,034	...	...	54,540	2,903	10,216	27,167	100,563	44,897
50	Hartford, Conn	199,000	87,160	63,784	23,169	...	...	8,188	...	...	...	...	16,699
51	Reading, Pa	139,298	139,298	...	...	...	...	...	...	...	...	...	...
53	San Antonio, Tex	167,429	139,738	...	...	...	...	...	...	...	...	...	27,691
54	New Bedford, Mass	11,406	...	...	...	10,891	...	...	...	...	...	...	515
55	Camden, N. J	378,605	...	...	...	...	...	241,354	2,658	48,457	44,883	21,027	20,226
56	Dallas, Tex	121,326	14,918	3,882	...	...	...	...	...	...	6,087	96,439	...
59	Wilmington, Del	15,934	...	...	...	...	...	...	7,440	...	...	8,494	...
60	Springfield, Mass	7,877	4,848	3,029	...	...	...	...	...	...	...	...	...
61	Des Moines, Iowa	279,385	...	...	...	29,239	...	52,344	76,814	20,074	22,854	33,758	44,302
62	Lawrence, Mass	6,707	...	...	6,707	...	...	...	...	...	...	...	...
63	St. Joseph, Mo	247,732	144,132	20,547	...	12,901	19,609	...	22,586	21,730	...	5,274	953
64	Troy, N. Y	122,107	96,609	5,230	...	...	232	1,455	5,874	220	11,569	918	...
66	Tacoma, Wash	728,396	...	...	...	...	...	40,560	146,590	157,411	153,061	48,488	182,286
67	Youngstown, Ohio	210,322	64,032	5,708	45,641	15,945	12,721	...	...	34,085	2,330	23,456	6,404
70	Somerville, Mass	10,410	...	...	7,290	...	...	1,170	...	...	1,950	...	...
71	Kansas City, Kans	398,863	33,772	137,768	107,746	8,037	41,218	18,963	2,588	...	15,301	4,827	28,643
72	Utica, N. Y	1,044,143	473,201	36,566	50,132	84,900	55,823	48,372	59,582	70,479	68,040	50,736	46,312
75	Schenectady, N. Y	549,462	91,976	21,190	68,333	8,353	45,072	89,200	41,853	37,581	33,685	66,595	45,624
80	Akron, Ohio	4,001	4,001	...	...	...	...	...	...	...	...	...	...
81	Norfolk, Va	427,864	...	45,140	179,065	8,159	157,354	13,381	24,765	...	...	...	...
82	Fort Worth, Tex	55,548	...	...	...	...	...	...	4,065	10,145	16,735	16,683	7,920
83	Wilkes-Barre, Pa	153,980	146,364	...	...	...	...	...	...	...	...	...	7,616
85	Savannah, Ga	140,814	...	...	...	...	...	...	...	...	140,814	...	...
86	Peoria, Ill	251,490	173,918	5,086	2,886	61,266	6,727	...	1,607	...	...	...	...
88	Fort Wayne, Ind	510,036	95,817	30,132	34,578	19,268	57,349	57,942	76,917	54,928	61,983	964	20,158
91	Terre Haute, Ind	87,790	36,362	36,560	...	...	...	...	12,996	...	...	1,872	...
93	Holyoke, Mass	12,746	...	...	...	...	...	...	12,746	...	...	...	...
99	Covington, Ky	77,285	77,285	...	...	...	...	...	...	...	...	...	...
100	South Bend, Ind	155,748	43,766	55,399	1,176	1,076	...	2,064	...	6,791	8,884	27,818	8,774
101	Passaic, N. J	33,652	...	...	...	...	33,652	...	...	...	...	...	...
102	Altoona, Pa	65,038	62,763	2,275	...	...	...	...	...	...	...	...	...
103	Mobile, Ala	86,882	...	...	...	17,000	37,000	32,882	...	...	...	...	...
104	Allentown, Pa	252,065	...	...	10,323	16,220	24,781	4,622	25,064	40,411	12,711	53,347	64,586
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.												
106	Saginaw, Mich	477,121	138,990	...	5,543	...	60,288	53,237	30,726	28,327	47,697	66,415	45,898
108	Wichita, Kans	310,067	89,475	...	...	...	27,590	28,299	...	28,921	...	...	135,782
109	Springfield, Ill	78,894	...	...	...	...	...	...	...	30,464	10,377	24,313	13,740
110	Binghamton, N. Y	49,796	49,796	...	...	...	...	...	...	...	...	...	...
112	Sioux City, Iowa	264,757	79,144	16,802	48,017	...	51,265	...	28,122	26,995	...	...	14,412
113	Little Rock, Ark	100,480	...	...	...	...	11,319	13,083	...	6,447	48,031	...	21,600
114	Springfield, Ohio	18,624	...	8,865	...	...	...	9,759	...	...	...	...	...
115	Atlantic City, N. J	48,925	...	...	...	...	...	...	...	25,722	...	23,203	...
117	Rockford, Ill	51,520	25,380	...	...	...	...	...	...	...	...	...	26,140
118	York, Pa	45,000	...	18,000	...	...	...	...	...	...	...	...	27,000
119	Lincoln, Nebr	212,465	11,208	25,587	...	...	25,535	29,694	24,975	36,809	39,679	18,978	...
120	Chattanooga, Tenn	79,899	58,550	734	...	1,711	...	...	...	...	...	...	18,904
121	Topeka, Kans	186,814	186,814	...	...	...	...	...	...	...	...	...	...
125	Pueblo, Colo	102,631	...	...	...	...	...	...	...	49,399	39,390	13,842	...
128	Davenport, Iowa	190,385	...	...	...	...	...	...	15,742	26,906	34,056	82,541	31,140
137	Kalamazoo, Mich	61,709	...	...	...	...	...	11,294	19,049	12,245	...	...	19,121
142	Racine, Wis	51,308	...	...	...	...	...	...	13,981	...	16,647	...	20,680
143	Elmira, N. Y	104,814	20,661	11,682	15,389	...	18,324	...	28,910	...	9,848	...	...
145	Knoxville, Tenn	200,795	...	...	...	...	...	...	...	...	46,787	49,276	104,732
148	Auburn, N. Y	109,272	...	...	14,160	21,490	24,998	...	...	10,281	27,393	7,922	3,028
150	Joliet, Ill	173,623	62,282	17,017	...	41,158	13,758	...	18,754	11,546	...	7,353	1,755
155	Joplin, Mo	3,592	...	3,592	...	...	...	...	...	...	...	...	...
157	Newport, Ky	6,509	...	...	...	...	...	1,762	...	1,328	1,583	...	1,836
158	South Omaha, Nebr	7,500	...	...	...	...	...	...	...	...	...	...	7,500

TABLE 24.—HIGHWAYS—AREA (SQUARE YARDS) OF BITULITHIC AND BITUMINOUS OR TAR-BOUND MACADAM PAVEMENTS IN SPECIFIED CITIES AT THE CLOSE OF THE YEAR, CLASSIFIED ACCORDING TO THE YEAR IN WHICH LAID: 1909.

[Cities for which no complete record by years was obtained are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 72.]

City number.	CITY.	PAVEMENT LAID—											
		In all years.	Prior to 1900	In 1900	In 1901	In 1902	In 1903	In 1904	In 1905	In 1906	In 1907	In 1908	In 1909
	Grand total	5,739,801	680,581	5,010	15,664	86,734	233,533	468,357	567,234	470,547	1,130,242	890,648	1,191,251
	Group I	1,737,251				7,711	55,893	221,077	321,900	217,778	270,392	329,174	313,326
	Group II	1,349,427	194,521			7,108	77,758	83,764	55,415	95,630	367,571	216,108	251,582
	Group III	1,462,644	169,260	5,010	15,664	39,840	45,460	140,959	148,720	134,418	281,169	245,713	236,422
	Group IV	1,190,479	316,800			32,075	54,413	22,557	41,199	22,721	211,110	99,653	389,951

GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.

City number.	CITY.	In all years.	Prior to 1900	In 1900	In 1901	In 1902	In 1903	In 1904	In 1905	In 1906	In 1907	In 1908	In 1909
2	Chicago, Ill	32,000					4,480	19,680	7,840				
4	St. Louis, Mo	862,820						148,736	252,111	130,242	106,058	121,839	103,834
5	Boston, Mass	200,805				7,711	33,010	18,196	33,773	15,471	16,020	44,484	32,140
6	Baltimore, Md	266,823								39,149	33,456	103,556	90,662
7	Cleveland, Ohio	24,297							17,311		3,408		3,578
9	Detroit, Mich	5,251					5,251						
13	Milwaukee, Wis	35,985						8,147	9,725	15,284			2,829
14	Newark, N. J	229,190					13,152	26,318	1,140	17,632	111,450	32,602	26,896
15	New Orleans, La	80,080										26,693	53,387

GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.

City number.	CITY.	In all years.	Prior to 1900	In 1900	In 1901	In 1902	In 1903	In 1904	In 1905	In 1906	In 1907	In 1908	In 1909
18	Los Angeles, Cal	164,267	164,267										
20	Kansas City, Mo	28,580								2,382	26,198		
21	Indianapolis, Ind	146,619								25,883	77,844	31,484	11,408
24	Providence, R. I	27,974									27,974		
25	Rochester, N. Y	20,800									20,800		
26	St. Paul, Minn	121,233									121,233		
28	Portland, Oreg	537,513					5,523	31,431	44,700	57,707	68,690	135,614	193,848
29	Columbus, Ohio	8,055									2,789	5,266	
31	Worcester, Mass	62,233				7,108	13,006	3,545					38,574
33	Syracuse, N. Y	3,767									3,767		
34	New Haven, Conn	46,380	5,550							9,658		31,172	
35	Scranton, Pa	28,818						7,543			18,276	2,999	
36	Paterson, N. J	17,295										9,573	7,722
43	Nashville, Tenn	120,663	24,704				59,229	26,015	10,715				
46	Dayton, Ohio	15,230						15,230					

TABLE 24.—HIGHWAYS—AREA (SQUARE YARDS) OF BITULITHIC AND BITUMINOUS OR TAR-BOUND MACADAM PAVEMENTS IN SPECIFIED CITIES AT THE CLOSE OF THE YEAR, CLASSIFIED ACCORDING TO THE YEAR IN WHICH LAID: 1909—Continued.

[Cities for which no complete record by years was obtained are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 72.]

City number.	CITY.	PAVEMENT LAID—											
		In all years.	Prior to 1900	In 1900	In 1901	In 1902	In 1903	In 1904	In 1905	In 1906	In 1907	In 1908	In 1909
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.												
52	Trenton, N. J	5,704											5,704
54	New Bedford, Mass	45,234			4,369		10,791	13,338			12,802	3,934	
56	Dallas, Tex	141,304									40,488	68,896	31,920
58	Lynn, Mass	54,920					3,765	8,728	16,984		9,774	15,669	
59	Wilmington, Del	120,880							8,363			60,361	52,156
60	Springfield, Mass	39,934						9,066	18,371	11,731		214	552
61	Des Moines, Iowa	1,886								1,886			
64	Troy, N. Y	14,790									5,354		9,436
66	Tacoma, Wash	70,723	37,775			10,519	22,429						
70	Somerville, Mass	39,758						7,085	7,604				25,069
78	Evansville, Ind	8,844								2,152	3,357	3,335	
79	Birmingham, Ala	258,745						30,923	69,525	95,970	62,327		
81	Norfolk, Va	17,952									17,952		
82	Fort Worth, Tex	26,171										26,171	
90	Portland, Me	306,280	131,485	5,010	6,180	4,211	6,816	13,058	18,929	15,597	39,783	35,271	29,940
93	Holyoke, Mass	81,582			1,595	12,929				7,082	11,828	30,417	17,731
94	Brockton, Mass	53,941			2,775	9,834		8,571	8,533				24,228
100	South Bend, Ind	38,584			745								37,839
103	Mobile, Ala	46,015									46,015		
104	Allentown, Pa	26,038					1,668	24,370					
105	Pawtucket, R. I	63,359				2,347		25,820	411		31,489	1,445	1,847
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.												
106	Saginaw, Mich	17,218				17,218							
108	Wichita, Kans	37,557								19,221			18,336
115	Atlantic City, N. J	164,078									95,769	9,135	59,174
116	Bay City, Mich	7,700				7,700							
124	Haverhill, Mass	33,828											33,828
126	Pueblo, Colo	38,887							13,383		25,504		
127	New Britain, Conn	3,580										3,580	
128	Davenport, Iowa	907										907	
133	Newton, Mass	692,266	316,800							3,500	57,275	62,624	252,067
137	Kalamazoo, Mich	43,531					43,531						
139	Woonsocket, R. I	12,265					10,882	885				498	
141	Fitchburg, Mass	9,052										2,141	6,911
143	Elmira, N. Y	11,789						11,789					
145	Knoxville, Tenn	51,640									30,637	20,768	235
148	Auburn, N. Y	26,951						9,883	17,068				
149	West Hoboken, N. J	19,400											19,400
151	Taunton, Mass	17,764				5,091			10,748		1,925		
152	Everett, Mass	2,066				2,066							

TABLE 25.—HIGHWAYS—AREA (SQUARE YARDS) OF CREOSOTED WOOD-BLOCK PAVEMENTS IN SPECIFIED CITIES AT THE CLOSE OF THE YEAR, CLASSIFIED ACCORDING TO THE YEAR IN WHICH LAID: 1909.

[Cities for which no complete record by years was obtained are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 72. Figures printed in italics are estimates.]

City number.	CITY.	PAVEMENT LAID—											
		In all years.	Prior to 1900	In 1900	In 1901	In 1902	In 1903	In 1904	In 1905	In 1906	In 1907	In 1908	In 1909
	Grand total	[1] 2,542,052	291,550	16,748	59,914	58,972	100,380	209,566	199,046	248,908	361,229	543,119	452,700
	Group I	[1] 1,000,587	19,888	1,295	19,556	1,152	41,848	87,112	130,913	127,414	176,106	209,528	185,775
	Group II	[1] 1,239,174	213,036	14,217	40,358	45,148	50,654	102,432	51,610	89,667	141,111	286,973	208,968
	Group III	[1] 201,119		1,236		12,672	7,501	16,512	16,523	12,319	29,759	41,640	62,957
	Group IV	[1] 101,172	58,626				297	3,510		19,508	14,253	4,978	
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.												
1	New York, N. Y	[1] 466,955				1,152	13,121	50,633	117,460	97,330	96,971	66,114	24,174
2	Chicago, Ill	176,320						9,120	3,200	11,840	9,120	87,024	56,016
3	Philadelphia, Pa	55,000											55,000
4	St. Louis, Mo	55,554					24,580	25,229					5,745
5	Boston, Mass	55,709		1,295	19,440		2,820			10,704	9,716	5,722	6,012
6	Baltimore, Md	33,592			116		1,327	852	7,760	7,540	15,997		
7	Cleveland, Ohio	19,888	19,888										
9	Detroit, Mich	89,122							2,493		19,990	50,668	15,971
13	Milwaukee, Wis	34,320									24,312		10,008
14	Newark, N. J	5,796						1,278					4,518
15	New Orleans, La	8,331											8,331
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.												
17	Minneapolis, Minn	636,139				13,426	31,015	58,429	44,838	75,727	103,334	166,032	143,338
19	Jersey City, N. J	33,281										4,497	28,784
20	Kansas City, Mo	5,670									5,670		
21	Indianapolis, Ind	396,017	195,640	14,217	36,736	29,718	2,576	33,016	1,559	12,453	10,050	51,319	8,733
23	Seattle, Wash	4,360				1,560	2,800						
26	St. Paul, Minn	16,399					200	2,802	3,487	270			9,640
28	Portland, Oreg	40,092	12,402		3,622		14,063	8,185	1,726	94			
29	Columbus, Ohio	6,160	4,994			444					722		
31	Worcester, Mass	531								176	355		
32	Atlanta, Ga	51,333									7,040	44,293	
34	New Haven, Conn	18,999								947		17,059	993
36	Paterson, N. J	19,244									4,700	3,773	10,771
42	Grand Rapids, Mich	10,949									9,240		1,709
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.												
48	Bridgeport, Conn	14,569										13,695	874
56	Dallas, Tex	514											514
60	Springfield, Mass	46,738					5,652	11,981		6,460	4,590	5,624	12,431
61	Des Moines, Iowa	34,491									858	20,021	13,612
72	Utica, N. Y	1,849					1,849						
76	Hoboken, N. J	2,646											2,646
81	Norfolk, Va	2,000											2,000
91	Terre Haute, Ind	12,672				12,672							
93	Holyoke, Mass	15,230						4,531	2,037	5,859	1,383		1,420
98	Bayonne, N. J	11,528									9,228	2,300	
100	South Bend, Ind	*1,236*		*1,236*									
103	Mobile, Ala	57,646							14,486		13,700		29,460
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.												
112	Sioux City, Iowa	16,122								16,122			
114	Springfield, Ohio	3,807					297	3,510					
115	Atlantic City, N. J	3,767									3,767		
120	Chattanooga, Tenn	1,461								1,461			
128	Davenport, Iowa	1,265									1,265		
139	Woonsocket, R. I	2,090										2,090	
140	Galveston, Tex	58,626	58,626										
155	Joplin, Mo	2,888										2,888	
156	La Crosse, Wis	11,146								1,925	9,221		

The areas reported are exclusive of 802 square yards between street car tracks.

TABLE 26.—HIGHWAYS—AREA (SQUARE YARDS) OF BRICK PAVEMENTS IN SPECIFIED CITIES AT THE CLOSE OF THE YEAR, CLASSIFIED ACCORDING TO THE YEAR IN WHICH LAID: 1909.

[Cities for which no complete record by years was obtained are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 72.]

City number.	CITY.	PAVEMENT LAID—											
		In all years.	Prior to 1900	In 1900	In 1901	In 1902	In 1903	In 1904	In 1905	In 1906	In 1907	In 1908	In 1909
	Grand total	36,994,578	12,310,536	1,608,052	1,563,640	1,872,324	1,761,470	2,254,309	2,373,307	2,526,644	3,285,901	3,775,170	3,663,225
	Group I	15,533,878	4,721,636	652,594	592,739	992,049	756,706	1,038,349	1,055,595	1,075,872	1,367,787	1,573,484	1,707,067
	Group II	7,591,722	2,794,891	279,314	229,847	227,245	230,310	268,891	453,492	549,605	764,312	1,111,540	682,275
	Group III	8,260,997	2,594,331	311,772	463,239	436,732	535,881	668,432	542,956	640,262	779,344	691,022	587,026
	Group IV	5,617,981	2,199,678	364,372	277,815	216,298	238,573	278,637	321,264	260,905	374,458	399,124	686,857
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.												
2	Chicago, Ill	1,323,040	261,440	147,360	115,040	177,760	105,600	39,040	50,240	45,280	16,480	145,719	219,081
3	Philadelphia, Pa	2,588,459	1,936,965	118,857	82,837	62,272	38,858	13,678	40,713	31,860	51,393	123,524	87,502
4	St. Louis, Mo	2,966,674	266,498	37,395	76,299	393,015	122,522	296,127	283,976	337,383	351,019	222,202	580,238
5	Boston, Mass	21,891	830	....	1,057	1,506	....	....	....	221	179	256	17,842
6	Baltimore, Md	217,582	17,600	11,476	24,782	25,929	2,043	3,223	10,222	30,822	23,757	20,800	46,928
7	Cleveland, Ohio	4,493,755	1,235,704	253,734	233,423	178,774	226,087	464,453	414,333	263,956	424,023	411,363	387,905
9	Detroit, Mich	2,114,378	598,971	27,745	28,914	69,674	100,157	122,259	129,392	179,576	293,489	372,964	191,237
10	Buffalo, N. Y	383,436	131,985	23,210	....	1,701	43,251	13,398	13,838	28,955	66,207	50,874	10,017
13	Milwaukee, Wis	550,695	28,689	31,334	16,013	43,893	49,102	49,992	55,697	31,804	51,349	100,139	92,683
14	Newark, N. J	673,617	54,199	1,483	14,374	37,525	69,086	36,179	57,184	117,157	89,891	125,643	70,896
15	New Orleans, La	177,936	166,340	....	....	....	....	....	....	8,858	....	....	2,738
16	Washington, D. C	22,415	22,415	....	....	....	....	....	....	....	....	....	....
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.												
17	Minneapolis, Minn	341,720	49,712	64,757	26,450	13,231	35,128	51,417	38,374	10,924	21,128	22,522	8,077
18	Los Angeles, Cal	75,797	10,778	....	....	....	....	....	1,500	6,303	3,327	52,993	896
19	Jersey City, N. J	11,756	....	....	....	....	....	....	....	....	3,380	8,022	354
21	Indianapolis, Ind	1,044,519	405,317	17,268	13,354	26,129	42,055	52,530	23,922	69,509	128,515	189,514	76,406
23	Seattle, Wash	293,183	....	....	46,540	29,568	5,104	20,288	15,776	12,992	45,608	41,794	75,513
24	Providence, R. I	7,872	7,421	....	....	....	....	....	....	....	....	....	451
25	Rochester, N. Y	784,326	103,145	6,268	10,136	23,047	28,225	40,026	104,629	147,542	182,087	88,999	50,222
26	St. Paul, Minn	[1] 195,214	54,204	36,649	12,729	35,899	40,401	3,978	....	1,851	3,422	6,081	....
28	Portland, Oreg	11,088	1,950	....	....	....	....	4,150	4,988	....	....	....	....
29	Columbus, Ohio	2,491,522	1,296,286	4,316	13,518	24,388	21,405	34,531	83,365	181,603	129,924	456,930	245,256
31	Worcester, Mass	11,534	4,050	....	....	....	....	1,137	145	....	....	4,527	1,675
34	New Haven, Conn	146,831	35,601	48,206	47,784	10,341	....	....	....	419	....	4,480	....
35	Scranton, Pa	123,686	29,764	2,150	41,285	5,076	260	25,349	7,152	....	....	....	12,650
36	Paterson, N. J	137,207	70,207	67,000	....	....	....	....	....	....	....	....	....
37	Omaha, Nebr	723,107	228,156	12,342	....	28,691	5,166	....	58,654	38,350	105,572	144,090	102,086
40	Richmond, Va	2,278	741	....	....	....	....	....	....	....	....	1,537	....
42	Grand Rapids, Mich	534,735	91,874	12,930	8,749	24,123	52,566	17,670	84,949	30,929	74,905	37,546	98,494
43	Nashville, Tenn	35,376	32,090	....	....	2,416	....	....	....	....	....	....	870
44	Lowell, Mass	3,116	1,272	....	1,844	....	....	....	....	....	....	....	....
46	Dayton, Ohio	616,855	372,323	7,428	7,458	4,336	....	17,815	30,038	49,183	66,444	52,505	9,325

---

[1] The areas reported are exclusive of 10,350 square yards between street car tracks.

Table 26.—HIGHWAYS—AREA (SQUARE YARDS) OF BRICK PAVEMENTS IN SPECIFIED CITIES AT THE CLOSE OF THE YEAR, CLASSIFIED ACCORDING TO THE YEAR IN WHICH LAID: 1909—Continued.

[Cities for which no complete record by years was obtained are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 72.]

City number.	CITY.	PAVEMENT LAID—											
		In all years.	Prior to 1900	In 1900	In 1901	In 1902	In 1903	In 1904	In 1905	In 1906	In 1907	In 1908	In 1909
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.												
47	Albany, N. Y.	550,260	278,933	17,478	24,295	15,711	12,652	47,852	32,010	27,631	25,384	11,498	56,816
48	Bridgeport, Conn.	90,592	5,883	1,848	17,929	4,740	8,825	4,251	8,451	13,776	11,876	7,447	5,566
49	Spokane, Wash.	15,665	4,710					6,465				3,150	1,340
53	San Antonio, Tex.	7,490							7,490				
54	New Bedford, Mass.	9,276				8,231	1,045						
58	Lynn, Mass.	2,679	2,679										
59	Wilmington, Del.	226,987	188,045	10,164	6,768	11,063	4,113	5,959		875			
60	Springfield, Mass.	86,140	38,565	16,834	14,600	12,649	2,080			483	455	474	
63	St. Joseph, Mo.	569,620	99,398	12,730	16,328	16,844	58,904	59,427	71,191	66,737	73,807	51,094	43,160
64	Troy, N. Y.	278,454	113,708		19,848	12,621		65,012	20,226	6,316	24,184	5,675	10,864
66	Tacoma, Wash.	171,233	2,366					41,519		6,763	56,402	34,356	29,827
67	Youngstown, Ohio.	478,408	28,089	3,170	2,174			17,707	3,374	78,864	129,763	78,302	136,905
70	Somerville, Mass.	5,640		3,246					433	788	1,173		
71	Kansas City, Kans.	968,753	214,738	104,971	193,103	99,632	158,928	50,994	47,040	70,008	18,210	2,936	8,193
72	Utica, N. Y.	13,355	2,229	4,774	317							3,719	2,316
75	Schenectady, N. Y.	192,131	37,963	5,693	6,162	23,642	18,528	28,301		7,245	3,266	36,940	24,391
80	Akron, Ohio.	785,312	350,000		15,000	22,275	32,226	100,636	42,587	47,588	35,000	60,000	*80,000*
81	Norfolk, Va.	32,858	20,000						12,858				
82	Fort Worth, Tex.	76,384					14,080	27,104		18,600	16,600		
83	Wilkes-Barre, Pa.	270,487	96,240	8,913	2,695	9,735	1,833		33,311	33,309	44,623	15,533	24,295
85	Savannah, Ga.	342,519	23,212	16,562	22,960	48,631	61,313	58,244	45,195	23,033	12,048	24,333	6,988
86	Peoria, Ill.	880,188	483,121	22,072	21,610	65,233	27,544	47,347	10,156	73,035	34,718	61,064	34,288
88	Fort Wayne, Ind.	335,479	232,035	9,237	9,958	21,087	32,124	9,180	11,988		365	5,963	3,542
89	Charleston, S. C.	82,433			1,493		1,366		34,398	1,342	3,592	18,605	21,637
90	Portland, Me.	4,084	530	183	1,766					715	250		640
91	Terre Haute, Ind.	404,888	22,823				19,812	73,100		70,640	70,210	148,303	
93	Holyoke, Mass.	41,489	21,632		3,547	4,771					11,539		
98	Bayonne, N. J.	25,196									10,015	9,531	5,650
100	South Bend, Ind.	872,663	312,562	70,837	78,476	55,501	64,515	16,344	106,520	67,973	86,859	12,277	799
101	Passaic, N. J.	4,925								4,100		825	
102	Altoona, Pa.	312,818	12,905				1,041	8,990	728	17,726	97,342	97,378	76,708
103	Mobile, Ala.	73,652					14,952		55,000				3,700
104	Allentown, Pa.	36,974		3,060	4,210	4,366				2,715	11,663	1,559	9,401
105	Pawtucket, R. I.	1,965	1,965										
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.												
106	Saginaw, Mich.	245,552	112,180	18,509	21,421	2,421	19,471	16,385	2,855	11,356	13,493	13,686	13,775
107	Canton, Ohio.	537,631	227,057	19,218	26,134	10,332	12,445	2,630	16,312	34,556	11,226	33,981	143,740
108	Wichita, Kans.	116,218					9,176	8,173	14,060	14,796	22,119	2,524	45,370
110	Binghamton, N. Y.	229,556	43,509	14,926	16,362	18,227	14,329	13,192	18,940	29,161	39,186	8,976	12,748
111	Lancaster, Pa.	109,201	42,986	30,071	447	5,441	1,554			3,514	20,391	1,555	3,242
112	Sioux City, Iowa.	158,413	100,070		22,948	1,131	22,964	6,860		4,440			
113	Little Rock, Ark.	185,504	25,188						27,066		38,223	10,650	84,377
115	Atlantic City, N. J.	199,275	23,007	22,847	4,061	30,283	8,680	1,029	50,332		12,751	22,381	23,904
118	York, Pa.	53,000	53,000										
119	Lincoln, Nebr.	561,229	508,606				8,275			4,380	792	9,857	29,319
120	Chattanooga, Tenn.	121,546	86,196							4,676		3,940	26,734
121	Topeka, Kans.	704,704	116,224	60,600	98,560	82,133	60,600	69,342	25,330	30,497	38,895	44,802	77,721
123	Malden, Mass.	1,066				1,666							
130	Wheeling, W. Va.	450,154	323,553	33,800	15,999	33,599	13,663		11,578				17,962
131	Augusta, Ga.	115,469	1,209				2,151	51,641	7,850	10,744	8,030	16,938	16,906
134	Dubuque, Iowa.	160,520	115,842		995						591	33,728	9,364
135	Butte, Mont.	15,115											15,115
137	Kalamazoo, Mich.	223,689	39,917	16,298		111	28,927	6,119	45,966	31,922	35,393	10,591	8,445
139	Woonsocket, R. I.	10,335							5,675		4,246		414
140	Galveston, Tex.	112,390	5,560	5,340				38,383	13,366	17,664	858	19,419	11,800
142	Racine, Wis.	311,634	31,510		53,574	9,480		1,109	43,098		56,905	78,792	37,166
143	Elmira, N. Y.	102,910	37,414	3,865	13,448	11,504	16,462		139				20,078
145	Knoxville, Tenn.	85,786	61,838						8,443		2,366	4,571	8,568
148	Auburn, N. Y.	33,886		19,013		1,550	4,802	1,487	379	2,552	2,140	130	1,833
150	Joliet, Ill.	88,758	72,076		3,866	1,750						5,797	5,269
152	Everett, Mass.	3,056											3,056
155	Joplin, Mo.	105,325		58,355				1,136		1,111	25,100	18,196	1,427
156	La Crosse, Wis.	150,793		61,530		6,670	15,074	17,876	25,081	10,955	3,378	3,011	7,218
157	Newport, Ky.	153,380	74,902					3,737	4,794	18,065	25,083	16,999	9,806
158	South Omaha, Nebr.	271,280	97,834					39,538		30,516	13,292	38,600	51,500

TABLE 27.—HIGHWAYS—AREA (SQUARE YARDS) OF WATER-BOUND MACADAM PAVEMENTS IN SPECIFIED CITIES AT THE CLOSE OF THE YEAR, CLASSIFIED ACCORDING TO THE YEAR IN WHICH LAID: 1909.

[Cities for which no complete record by years was obtained are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 72.]

City number.	CITY.	PAVEMENT LAID—											
		In all years.	Prior to 1900	In 1900	In 1901	In 1902	In 1903	In 1904	In 1905	In 1906	In 1907	In 1908	In 1909
	Grand total	53,042,015	35,851,418	1,926,110	1,720,359	1,570,822	2,290,851	1,650,406	1,641,727	1,535,458	1,666,836	1,935,283	1,252,745
	Group I	25,254,064	17,989,049	708,118	640,284	617,325	1,249,596	660,276	789,318	827,472	560,616	665,698	546,312
	Group II	13,342,400	9,539,799	279,469	408,133	318,372	344,199	392,019	292,486	329,663	523,484	583,407	331,369
	Group III	7,316,689	4,573,620	355,449	363,398	299,772	332,847	291,312	177,858	172,275	311,305	246,458	192,395
	Group IV	7,128,862	3,748,950	583,074	308,544	335,353	364,209	306,799	382,065	206,048	271,431	439,720	182,669
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.												
2	Chicago, Ill	9,106,560	4,973,440	324,000	314,400	411,040	321,920	463,840	628,360	695,520	300,160	342,154	336,726
3	Philadelphia, Pa	3,147,414	2,022,182	155,004	171,292	105,301	269,197	63,443	46,125	27,014	118,221	93,098	76,542
4	St. Louis, Mo	5,844,327	5,377,363	194,304	107,078	22,810	28,301	16,263	....	14,362	17,741	46,886	19,219
6	Baltimore, Md	645,075	12,202	....	3,365	4,853	526,039	7,392	24,461	31,127	35,636	....	....
7	Cleveland, Ohio	27,989	....	....	....	....	....	....	....	24,312	....	3,677	....
10	Buffalo, N. Y	297,937	212,770	4,064	2,534	5,946	....	42,750	4,479	7,007	1,643	....	16,744
13	Milwaukee, Wis	5,778,821	5,277,341	26,813	30,081	27,342	25,980	56,853	41,095	28,130	87,215	116,676	61,296
14	Newark, N. J	405,941	113,751	3,933	11,534	40,033	78,159	9,735	49,798	....	....	63,212	35,786
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.												
17	Minneapolis, Minn	259,001	72,450	8,822	44,756	10,020	28,605	22,585	2,364	15,992	4,426	10,620	38,361
21	Indianapolis, Ind	209,483	90,141	....	....	....	21,183	39,278	....	....	53,364	5,517	....
24	Providence, R. I	3,531,616	3,190,000	41,431	63,008	29,216	26,400	35,376	40,656	44,000	3,520	17,952	40,057
25	Rochester, N. Y	385,219	220,102	12,393	9,457	22,933	9,078	17,616	6,429	33,261	11,080	42,870	....
26	St. Paul, Minn	728,494	207,938	....	....	2,800	22,611	101,092	33,726	85,250	158,600	71,742	44,735
27	Denver, Colo	204,957	16,799	....	....	43,651	39,240	43,651	47,617	....	....	13,999	....
29	Columbus, Ohio	143,510	43,244	....	....	3,173	10,490	14,122	18,505	....	3,010	35,946	15,020
31	Worcester, Mass	881,414	484,618	60,234	54,471	21,994	41,786	24,077	8,580	34,238	30,338	86,914	34,164
34	New Haven, Conn	1,171,230	942,197	37,194	87,843	6,362	18,116	....	....	937	57,219	12,967	8,375
36	Paterson, N. J	1,462,334	1,462,334	....	....	....	....	....	....	....	....	....	....
37	Omaha, Nebr	63,454	29,020	....	730	....	10,834	6,218	4,522	1,400	....	10,730	....
38	Fall River, Mass	613,500	302,440	15,230	47,728	34,598	22,678	25,302	48,003	43,186	23,528	33,955	16,862
40	Richmond, Va	30,391	14,155	1,381	....	....	4,108	8,165	2,582	....	....	....	....
42	Grand Rapids, Mich	176,527	81,218	11,193	45,384	....	9,386	....	....	....	5,561	11,165	12,620
43	Nashville, Tenn	2,847,060	2,220,200	22,371	18,280	87,720	22,039	....	20,525	32,530	134,200	168,080	121,115
44	Lowell, Mass	615,105	162,943	69,220	36,476	55,905	50,275	54,537	58,977	38,869	38,638	49,195	70
46	Dayton, Ohio	19,105	....	....	....	....	7,370	....	....	....	....	11,735	....

Table 27.—HIGHWAYS—AREA (SQUARE YARDS) OF WATER-BOUND MACADAM PAVEMENTS IN SPECIFIED CITIES AT THE CLOSE OF THE YEAR, CLASSIFIED ACCORDING TO THE YEAR IN WHICH LAID: 1909—Continued.

[Cities for which no complete record by years was obtained are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 72. Figures printed in italics are estimates.]

City number.	CITY.	PAVEMENT LAID—											
		In all years.	Prior to 1900	In 1900	In 1901	In 1902	In 1903	In 1904	In 1905	In 1906	In 1907	In 1908	In 1909
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.												
47	Albany, N. Y.	113,239	54,871	....	862	....	4,375	37,277	8,580	2,990	1,661	2,623	....
50	Hartford, Conn.	*1,672,000*	*1,145,760*	91,007	56,042	49,433	70,462	43,400	45,553	32,999	37,627	52,677	47,040
54	New Bedford, Mass.	940,443	585,156	46,044	60,288	29,236	38,572	41,690	2,043	20,527	35,478	25,925	55,484
57	Salt Lake City, Utah	75,166	....	....	....	....	....	....	....	5,261	66,147	3,758	....
59	Wilmington, Del.	287,595	231,283	7,095	4,837	9,977	4,130	4,362	3,966	15,015	....	4,647	2,283
60	Springfield, Mass.	1,205,564	551,573	75,131	99,561	60,425	104,259	45,589	48,327	63,474	60,045	47,288	49,892
62	Lawrence, Mass.	461,711	264,048	26,439	38,785	26,672	25,895	17,941	18,255	16,148	15,325	6,588	5,615
64	Troy, N. Y.	53,543	52,743	....	....	....	....	....	....	....	800	....	....
66	Tacoma, Wash.	6,172	....	....	....	....	....	....	....	....	....	....	6,172
67	Youngstown, Ohio.	15,227	15,227	....	....	....	....	....	....	....	....	....	....
70	Somerville, Mass.	791,413	562,755	37,846	26,444	79,301	35,787	17,600	8,213	....	....	23,467	....
71	Kansas City, Kans.	33,183	11,581	....	....	....	....	5,011	....	....	....	16,591	....
72	Utica, N. Y.	9,596	3,018	866	....	....	5,712	....	....	....	....	....	....
75	Schenectady, N. Y.	34,949	....	14,035	....	12,284	4,317	4,313	....	....	....	....	....
78	Evansville, Ind.	82,133	82,133	....	....	....	....	....	....	....	....	....	....
80	Akron, Ohio.	107,087	66,087	....	....	....	....	41,000	....	....	....	....	....
81	Norfolk, Va.	24,542	....	....	....	....	....	....	....	....	24,542	....	....
83	Wilkes-Barre, Pa.	983	....	....	....	....	....	....	....	....	....	....	983
85	Savannah, Ga.	14,912	14,912	....	....	....	....	....	....	....	....	....	....
86	Peoria, Ill.	17,264	....	5,525	11,739	....	....	....	....	....	....	....	....
89	Charleston, S. C.	81,026	27,709	14,447	10,242	16,704	5,647	....	570	....	....	....	5,707
93	Holyoke, Mass.	167,376	66,098	6,520	22,198	4,332	19,509	11,320	12,200	9,903	15,296	....	....
94	Brockton, Mass [1]	268,250	99,640	30,494	29,772	362	2,683	21,809	12,361	3,166	35,853	32,110	....
100	South Bend, Ind.	14,836	....	....	....	2,997	....	....	10,891	....	948	....	....
101	Passaic, N. J.	498,960	498,960	....	....	....	....	....	....	....	....	....	....
102	Altoona, Pa.	10,000	5,000	....	....	....	....	....	....	....	....	5,000	....
105	Pawtucket, R. I.	329,519	235,066	....	2,628	8,049	11,499	....	6,899	2,792	17,583	25,784	19,219
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.												
106	Saginaw, Mich.	371,824	215,461	8,655	3,561	16,765	19,676	13,818	5,975	4,490	5,175	78,248	....
108	Wichita, Kans.	6,393	....	....	....	....	....	....	....	....	....	6,393	....
109	Springfield, Ill.	38,870	14,406	....	....	....	....	....	24,464	....	....	....	....
115	Atlantic City, N. J.	388,117	52,641	63,198	6,833	66,854	....	....	96,621	....	....	84,218	17,752
117	Rockford, Ill.	1,135,139	415,882	104,737	98,248	89,573	87,558	80,097	45,856	67,620	65,005	40,559	40,004
120	Chattanooga, Tenn.	34,407	28,103	....	....	....	....	....	....	6,304	....	....	....
121	Topeka, Kans.	9,387	9,387	....	....	....	....	....	....	....	....	....	....
124	Haverhill, Mass.	230,905	120,727	....	....	33,296	18,538	15,442	6,342	12,083	....	15,216	9,261
125	Pueblo, Colo.	19,507	....	....	....	....	....	17,330	2,177	....	....	....	....
129	McKeesport, Pa.	10,000	10,000	....	....	....	....	....	....	....	....	....	....
130	Wheeling, W. Va.	26,048	26,048	....	....	....	....	....	....	....	....	....	....
133	Newton, Mass.	1,616,854	936,320	281,600	....	....	86,827	77,440	70,400	23,467	93,867	46,933	....
134	Dubuque, Iowa.	1,061,271	1,001,343	....	....	2,730	1,950	9,981	667	7,088	3,118	7,757	26,637
137	Kalamazoo, Mich.	7,466	....	7,466	....	....	....	....	....	....	....	....	....
141	Fitchburg, Mass.	147,448	48,257	15,101	6,970	5,174	21,400	4,541	7,392	14,360	11,611	12,642	....
142	Racine, Wis.	62,054	....	....	46,515	....	....	277	....	....	7,846	2,554	4,862
143	Elmira, N. Y.	73,626	50,244	....	....	....	2,667	....	20,715	....	....	....	....
148	Auburn, N. Y.	*624,213*	*114,986*	*49,280*	*49,280*	*49,280*	*49,280*	*49,280*	*49,280*	*49,280*	*49,280*	*49,280*	*65,707*
150	Joliet, Ill.	289,760	152,794	50,407	53,294	....	21,159	....	10,515	....	....	....	1,591
152	Everett, Mass.	383,539	237,839	2,630	14,000	8,200	17,650	14,780	6,900	11,840	2,000	67,700	....
156	La Crosse, Wis.	592,034	314,512	....	29,843	63,481	37,504	23,813	34,761	9,516	33,529	28,220	16,855

---

[1] The areas reported are exclusive of 13,815 square yards between street car tracks.

TABLE 28.—HIGHWAYS—LENGTH, AREA, AND AVERAGE WIDTH OF ALLEYS, CLASSIFIED ACCORDING TO KIND OF SURFACE: 1909.

[Cities having no alleys reported are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 74. Figures printed in italics are estimates.]

City number.	CITY.	ALL ALLEYS.			PAVED ALLEYS.												UNPAVED ALLEYS.	
					With durable pavements.										With non-durable pavements.			
					Total.		Granite and Belgian block.		Brick.		Asphalt and asphalt block.		All other.					
		Length (miles).	Area (square yards).	Average width (feet).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).
	Grand total	[1]7,329.3	[1]61,019,999	14.1	[1]741.3	[1]7,264,694	155.1	1,339,966	282.9	3,058,665	19.1	146,074	192.2	1,810,389	209.8	1,669,096	6,378.2	52,086,209
	Group I	[1]2,861.9	[1]24,688,285	14.1	[1]470.3	[1]4,961,532	89.1	810,067	150.7	1,947,446	14.2	104,385	124.3	1,190,034	71.8	503,350	2,319.8	19,223,403
	Group II	2,177.0	18,285,516	14.4	181.1	1,498,751	45.4	355,653	74.9	592,822	2.5	19,636	58.3	530,640	77.8	553,377	1,918.1	16,233,388
	Group III	1,370.8	12,229,898	16.5	50.3	463,663	11.7	93,070	30.8	287,791	1.9	18,678	5.9	64,124	44.9	428,476	1,275.6	11,337,759
	Group IV	919.6	5,816,300	11.1	39.6	340,748	8.9	81,176	26.5	230,606	0.5	3,375	3.7	25,591	15.3	183,893	864.7	5,291,659
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.																	
2	Chicago, Ill	1,434.9	10,044,230	12.0	60.2	421,050	10.5	73,780	39.6	276,850	10.1	70,420			71.7	501,900	1,303.0	9,121,280
4	St. Louis, Mo	352.2	3,381,766	16.5	172.9	1,674,353	73.9	706,419	97.5	955,534	0.1	762	1.4	11,638			179.3	1,707,413
5	Boston, Mass	4.8	24,834	8.7	4.8	24,834	1.8	9,794	0.1	528	2.8	14,414	0.1	98				
6	Baltimore, Md	116.2	816,759	12.0	110.5	766,226	0.1	956	1.6	8,656	0.2	764	108.6	755,850			5.7	50,533
8	Pittsburgh, Pa	(3)	(3)															
9	Detroit, Mich	457.0	*5,014,103*	18.6	22.6	247,437			11.2	120,262	0.2	2,114	11.2	125,061			434.4	*4,766,666*
10	Buffalo, N. Y	7.7	51,173	11.4	3.4	23,166	2.6	17,068	0.1	524	0.7	5,574					4.3	28,007
11	San Francisco, Cal	*5.0*	*29,454*	9.9	*2.9*	*17,023*							*2.9*	*17,023*			*2.1*	*12,431*
12	Cincinnati, Ohio	(3)	(3)															
13	Milwaukee, Wis	[1]*482.0*	[1]*4,341,600*	15.3	92.0	909,600	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)			*390.0*	*3,432,000*
14	Newark, N. J	2.1	18,630	15.0	1.0	8,680	0.2	2,050	0.6	5,650	0.1	680	0.1	300	0.1	1,450	1.0	8,500
16	Washington, D. C	(2)	*965,736*		(2)	869,163			(2)	579,442	(2)	9,657	(2)	280,064			(2)	*96,573*
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.																	
17	Minneapolis, Minn	329.8	*3,096,543*	15.9	4.5	42,352	1.1	10,251	2.9	26,912	0.1	694	0.4	4,495			325.3	*3,054,191*
18	Los Angeles, Cal	25.8	181,632	12.0	2.8	19,712			2.8	19,712							23.0	161,920
19	Jersey City, N. J	(3)	(3)															
20	Kansas City, Mo	*62.6*	*512,427*	14.1	22.4	183,029	0.6	4,919	20.3	165,307	0.6	5,329	0.9	7,474	0.2	1,916	*40.0*	*327,482*
21	Indianapolis, Ind	(3)	(3)															
22	Louisville, Ky	*167.0*	*1,187,678*	12.3	62.3	447,661	20.1	141,504	39.5	287,220	0.1	563	2.6	18,374	18.9	133,267	*85.8*	*606,750*
23	Seattle, Wash	(3)	(3)															
24	Providence, R. I	(3)	(3)															
25	Rochester, N. Y	1.4	12,509	15.6	1.4	12,509	0.5	5,525	0.1	619	0.3	2,433	0.5	3,932				
26	St. Paul, Minn	263.5	*3,157,925*	20.4	3.5	41,584	0.5	6,035	2.8	33,167	0.1	2,025	0.1	357	0.1	1,320	259.9	*3,115,021*
27	Denver, Colo	*407.2*	*2,222,238*	9.3	13.0	117,217	1.6	14,715	*0.5*	4,154			10.9	98,348	4.2	37,821	*390.0*	*2,067,200*
29	Columbus, Ohio	(3)	(3)															
30	Toledo, Ohio	181.4	1,383,884	12.9	2.8	21,761	0.5	3,982	1.9	15,024	0.4	2,755					178.6	1,362,123
33	Syracuse, N. Y	1.9	(2)		0.2				0.2	(2)							1.7	(2)
34	New Haven, Conn	(3)	(3)															
35	Scranton, Pa	(3)	(3)															
36	Paterson, N. J	[4]0.3	489	3.0	0.3	489	0.1	97			0.2	392					(3)	(3)
37	Omaha, Nebr	180.0	1,699,918	16.2	5.0	57,218	3.9	45,425	0.4	6,581	0.1	95	0.6	5,117			175.0	1,642,700
39	Memphis, Tenn	113.1	1,061,911	15.9	3.1	29,378			0.5	5,256	0.6	5,350	2.0	18,772			110.0	1,032,533
40	Richmond, Va	46.5	387,200	14.1	16.5	123,200	16.5	123,200									30.0	264,000
41	Oakland, Cal	1.0	1,173	2.1													1.0	1,173
43	Nashville, Tenn	137.9	970,816	12.0	0.4	7,091			0.4	7,091					54.4	379,053	83.1	584,672
44	Lowell, Mass	2.9	25,450	15.0	0.2	1,800							0.2	1,800			2.7	23,650
46	Dayton, Ohio	254.7	2,383,723	15.9	42.7	393,750			2.6	21,779			40.1	371,971			212.0	1,989,973

[1] Kinds of material not reported for a portion of this total.
[2] Not reported.
[3] Reported with streets.
[4] Exclusive of alleys with unpaved surface.

TABLE 28.—HIGHWAYS—LENGTH, AREA, AND AVERAGE WIDTH OF ALLEYS, CLASSIFIED ACCORDING TO KIND OF SURFACE: 1909—Continued.

[Cities having no alleys reported are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 74. Figures printed in italics are estimates.]

City number.	CITY.	ALL ALLEYS.			PAVED ALLEYS.												UNPAVED ALLEYS.	
					With durable pavements.										With non-durable pavements.			
					Total.		Granite and Belgian block.		Brick.		Asphalt and asphalt block.		All other.					
		Length (miles).	Area (square yards).	Average width (feet).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).	Length (miles).	Area (square yards).
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.																	
47	Albany, N. Y.	0.4	4,200	18.0	0.4	4.200	...	...	...	...	...	...	0.4	4.200	...	...	...	...
49	Spokane, Wash	0.4	3,520	14.4	0.4	3,520	...	...	...	...	0.4	3,520	...	...	...	...	...	...
51	Reading, Pa	(2)	(2)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
52	Trenton, N. J	(2)	(2)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
53	San Antonio, Tex	*120.0*	1,056,000	15.0	...	...	...	...	...	...	...	...	...	...	...	...	*120.0*	1,056,000
56	Dallas, Tex	*200.0*	*1,290,667*	11.1	...	...	...	...	...	...	...	...	...	...	...	...	*200.0*	*1,290,667*
57	Salt Lake City, Utah	1.2	8,099	11.1	1.2	8,099	0.1	697	...	...	0.2	1,705	0.9	5,697	...	...	...	...
61	Des Moines, Iowa	*157.4*	*1,371,003*	14.7	7.4	64,203	...	...	7.4	64,203	...	...	...	...	...	...	*150.0*	*1,306,800*
62	Lawrence, Mass	1.0	8,218	14.1	0.2	1,550	0.2	1,550	...	...	...	...	...	...	...	...	0.8	6,668
63	St. Joseph, Mo	94.6	906,581	17.4	5.2	52,733	...	...	5.0	50,792	...	...	0.2	1,941	...	...	89.4	913,848
66	Tacoma, Wash	(2)	(2)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
68	Duluth, Minn	*201.2*	*2,360,260*	19.8	1.2	14,660	0.9	10,995	0.1	886	...	...	0.2	2,779	...	...	*200.0*	*2,345,600*
69	Houston, Tex	5.0	36,665	12.6	...	...	...	...	...	...	...	...	...	...	...	...	5.0	36,665
71	Kansas City, Kans	*50.5*	*449,870*	15.3	2.5	26,220	...	...	2.5	26,220	...	...	...	...	...	...	*48.0*	*423,650*
73	Waterbury, Conn	(2)	(2)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
79	Birmingham, Ala	[1] 2.0	24,003	20.1	2.0	24,003	0.4	5,334	1.4	16,891	0.2	1,778	...	...	...	...	(3)	(3)
80	Akron, Ohio	[1] 1.0	4,840	8.4	1.0	4,840	...	...	1.0	4,840	...	...	...	...	...	...	(3)	(3)
81	Norfolk, Va	*7.1*	*79,967*	19.2	3.1	40,767	...	...	...	...	...	...	3.1	40,767	...	...	*4.0*	*39,200*
82	Fort Worth Tex	99.5	(2)	...	...	...	...	...	...	...	...	...	...	...	...	...	99.5	(3)
83	Wilkes-Barre, Pa	16.0	148,929	16.2	1.0	6,667	0.1	906	0.3	1,785	0.1	310	0.5	3,666	...	...	15.0	142,262
86	Peoria, Ill	70.6	662,700	15.9	3.2	30,104	...	...	3.0	28,160	...	...	0.2	1.944	44.9	428,476	22.5	204,120
88	Fort Wayne, Ind	(1) 3.3	30,080	15.6	3.3	30,080	...	...	2.9	26,950	...	...	0.4	3,130	...	...	(3)	(3)
89	Charleston, S. C	(2)	(2)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
91	Terre Haute, Ind	85.3	1,001,766	20.1	1.5	18,100	...	...	1.5	18,100	...	...	...	...	...	...	83.8	983,666
93	Holyoke, Mass	10.9	92,000	14.4	1.3	10,500	...	...	1.3	10,500	...	...	...	...	...	...	9.6	81,500
95	Johnstown, Pa	48.9	440,980	15.3	4.0	34,780	1.8	15,800	2.2	18,920	...	...	...	...	...	...	44.9	406,200
97	Oklahoma City, Okla	*175.1*	*2,052,974*	20.1	2.1	23,165	...	...	1.1	11,800	1.0	11,365	...	...	...	...	*173.0*	*2,029,809*
99	Covington, Ky	19.4	136,576	12.0	9.3	65,472	8.2	57,728	1.1	7,744	...	...	...	...	...	...	10.1	71,104
100	South Bend, Ind	(2)	(2)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
101	Passaic, N. J	(2)	(2)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
102	Altoona, Pa	(2)	(2)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.																	
106	Saginaw, Mich	(2)	(2)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
108	Wichita, Kans	(2)	(2)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
109	Springfield, Ill	[1] 2.8	24,992	15.0	2.8	24,992	...	...	2.8	24,992	...	...	...	...	...	...	(3)	(3)
110	Binghamton, N. Y	0.8	4,667	9.9	0.8	4,667	...	...	0.8	4,667	...	...	...	...	...	...	...	...
111	Lancaster, Pa	(2)	(2)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
112	Sioux City, Iowa	*302.2*	[1] 20,149	[1] 15.6	2.2	20,149	...	...	2.1	19,688	0.1	461	...	...	...	...	*300.0*	(3)
113	Little Rock, Ark	*50.6*	*471,300*	15.9	0.6	2,000	...	...	0.6	2,000	...	...	...	...	...	...	*50.0*	*469,300*
114	Springfield, Ohio	85.9	704,685	14.1	1.9	15,793	...	...	1.9	15,793	...	...	...	...	...	...	84.0	688,892
116	Bay City, Mich	16.7	189,933	19.5	1.0	5,933	...	...	0.1	1,333	...	...	0.9	4,600	...	...	15.7	184,000
117	Rockford, Ill	[1] 0.2	1,980	18.6	0.2	1,980	...	...	0.2	1,980	...	...	...	...	...	...	(3)	(3)
118	York, Pa	15.0	(3)	...	...	...	...	...	...	...	...	...	...	...	...	...	15.0	(3)
119	Lincoln, Nebr	*49.4*	*434,601*	15.0	2.4	21,001	1.3	11,491	1.0	8,985	...	...	0.1	525	...	...	*47.0*	*413,600*
121	Topeka, Kans	(2)	(2)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
122	Sacramento, Cal	36.9	432,962	20.1	1.6	19,011	0.8	9,624	...	...	...	...	0.8	9,387	2.1	25,109	33.2	388,842
125	Pueblo, Colo	*160.1*	*1,502,571*	15.9	0.1	704	...	...	...	...	...	...	0.1	704	...	...	*160.0*	*1,501,867*
128	Davenport, Iowa	[1] 3.4	39,863	19.8	3.4	39,863	...	...	3.2	37,790	0.2	2,073	...	...	...	...	(3)	(3)
130	Wheeling, W. Va	22.1	155,323	12.0	5.3	37,333	...	...	5.3	37,333	...	...	...	...	...	...	16.8	117,990
131	Augusta, Ga	(2)	(2)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
132	Superior, Wis	[1] 2.0	11,264	9.6	2.0	11,264	...	...	0.5	2,816	...	...	1.5	8,448	...	...	(3)	(3)
134	Dubuque, Iowa	[1] 11.1	130,513	20.1	0.2	1,935	...	...	0.2	1,935	...	...	...	...	10.9	128,578	(3)	(3)
135	Butte, Mont	[1] 0.4	3,680	13.8	0.4	3,680	0.3	2,760	0.1	920	...	...	...	...	...	...	(3)	(3)
137	Kalamazoo, Mich	7.7	45,845	10.2	0.6	2,845	...	...	0.4	2,004	0.2	841	...	...	...	...	7.1	43,000
140	Galveston, Tex	40.0	468,666	20.1	0.2	2,095	...	...	0.2	2,095	...	...	...	...	...	...	39.8	466,571
142	Racine, Wis	0.4	3,340	14.1	0.4	3,340	0.2	1,509	0.2	1,831	...	...	...	...	...	...	...	...
143	Elmira, N. Y	*3.0*	*21,120*	12.0	...	...	...	...	...	...	...	...	...	...	...	...	*3.0*	*21,120*
144	Quincy, Ill	*24.0*	*225,508*	15.9	1.1	10,348	...	...	1.1	10,348	...	...	...	...	...	...	*22.9*	*215,160*
145	Knoxville, Tenn	[1] 1.5	10,560	12.0	1.5	10,560	...	...	1.3	8,800	...	...	0.2	1,760	...	...	(3)	(3)
146	New Castle, Pa	54.0	633,582	20.1	...	...	...	...	...	...	...	...	...	...	...	...	54.0	633,582
147	Macon, Ga	(2)	(2)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
150	Joliet, Ill	0.9	7,621	15.0	0.9	7,621	...	...	0.8	7,454	...	...	0.1	167	...	...	...	...
153	Oshkosh, Wis	*6.6*	*63,326*	16.2	*0.1*	*1,126*	...	...	*0.1*	*1,126*	...	...	...	...	...	...	*6.5*	*62,200*
155	Joplin, Mo	[1] 3.8	47,212	21.6	1.5	17,006	...	...	1.5	17,006	...	...	...	...	2.3	30,206	(3)	(3)
156	La Crosse, Wis	*9.5*	*85,360*	15.3	1.0	10,560	...	...	1.0	10,560	...	...	...	...	...	...	*8.5*	*74,800*
157	Newport, Ky	8.6	75,677	15.0	7.4	64,942	6.3	55,792	1.1	9,150	...	...	...	...	...	...	1.2	10,735
158	South Omaha, Nebr	(2)	(2)	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

[1] Exclusive of alleys with unpaved surface.

[2] Reported with streets.

[3] Not reported.

TABLE 29.—HIGHWAYS—LENGTH (MILES) OF SIDEWALKS AT THE CLOSE OF THE YEAR, CLASSIFIED ACCORDING TO KIND OF SURFACE: 1909.

[Cities with no reports of sidewalks are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 75. Figures printed in italics are estimates.]

City number.	CITY.	TOTAL.		CEMENT.		FLAGSTONE.		WOOD.		TAR CONCRETE.		ALL OTHER.	
		At close of year.	Laid during year.	At close of year.	Laid during year.	At close of year.	Laid during year.	At close of year.	Laid during year.	At close of year.	Laid during year.	At close of year.	Laid during year.
	Grand total	[1] 35,102.1	[1] 1,831.8	16,282.7	1,358.2	2,887.0	50.7	1,994.0	38.5	321.4	4.1	7,287.8	181.9
	Group I	[1] 15,163.3	613.2	6,443.1	466.3	1,409.7	31.3	597.5	17.6	....	....	3,714.0	98.0
	Group II	[1] 9,980.6	[1] 559.0	5,687.4	435.9	674.2	....	454.4	4.5	110.3	....	1,739.1	55.2
	Group III	[1] 5,038.7	[1] 492.7	2,173.3	307.1	375.9	8.7	394.0	16.0	8.6	....	1,057.4	25.9
	Group IV	[1] 4,919.5	166.9	1,978.9	148.9	427.2	10.7	548.1	0.4	202.5	4.1	777.3	2.8

GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.

City number.	CITY.	TOTAL. At close of year.	TOTAL. Laid during year.	CEMENT. At close of year.	CEMENT. Laid during year.	FLAGSTONE. At close of year.	FLAGSTONE. Laid during year.	WOOD. At close of year.	WOOD. Laid during year.	TAR CONCRETE. At close of year.	TAR CONCRETE. Laid during year.	ALL OTHER. At close of year.	ALL OTHER. Laid during year.
2	Chicago, Ill	*4,125.0*	357.8	*2,600.0*	258.1	*50.0*	0.4	*25.0*	2.2	....	....	*1,450.0*	97.1
3	Philadelphia, Pa	2,076.0	30.0	719.0	30.0	170.0	....	6.0	....	....	....	1,181.0	....
4	St. Louis, Mo	*1,241.6*	(2)	*659.8*	(2)	*75.0*	(2)	*50.0*	(2)	....	(2)	456.8	(2)
7	Cleveland, Ohio	945.7	40.0	343.3	17.6	602.4	22.4	....	....	....	....	....	....
8	Pittsburgh, Pa	[3] *1,016.0*	10.0	(2)	10.0	(2)	....	(2)	....	(2)	....	(2)	....
9	Detroit, Mich	[3] *1,333.0*	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
10	Buffalo, N. Y	741.0	60.5	348.0	54.2	117.0	....	276.0	6.3	....	....	....	....
11	San Francisco, Cal	[3] *650.0*	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
12	Cincinnati, Ohio	905.0	37.4	543.0	27.4	45.3	....	90.5	9.1	....	....	226.2	0.9
13	Milwaukee, Wis	*1,045.0*	34.0	*875.0*	34.0	*20.0*	....	*150.0*	....	....	....	....	....
14	Newark, N. J	*385.0*	23.5	*55.0*	15.0	*330.0*	8.5	....	....	....	....	....	....
16	Washington, D. C	*700.0*	20.0	*300.0*	20.0	....	....	....	....	....	....	*400.0*	....

GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.

City number.	CITY.	TOTAL. At close of year.	TOTAL. Laid during year.	CEMENT. At close of year.	CEMENT. Laid during year.	FLAGSTONE. At close of year.	FLAGSTONE. Laid during year.	WOOD. At close of year.	WOOD. Laid during year.	TAR CONCRETE. At close of year.	TAR CONCRETE. Laid during year.	ALL OTHER. At close of year.	ALL OTHER. Laid during year.
17	Minneapolis, Minn	731.3	30.7	704.4	30.7	....	....	26.9	....	....	....	....	....
18	Los Angeles, Cal	*1,175.4*	*19.9*	*1,175.4*	*19.9*	....	....	....	....	....	....	....	....
20	Kansas City, Mo	[3] *711.5*	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
22	Louisville, Ky	*360.0*	7.4	*126.0*	5.0	*18.0*	....	....	....	....	....	216.0	2.4
23	Seattle, Wash	751.7	131.8	541.0	130.4	....	....	210.7	1.4	....	....	....	....
25	Rochester, N. Y	*509.0*	30.5	*475.8*	30.5	*31.8*	(4)	1.0				0.4	....
26	St. Paul, Minn	512.8	28.0	499.6	24.9	....	....	9.4	3.1	....	....	3.8	....
27	Denver, Colo	*369.2*	[3] 63.4	266.4	(2)	102.8	(2)	....	....	....	....	....	....
28	Portland, Oreg	610.1	73.9	397.4	60.8	....	....	200.4	....	....	....	12.3	13.1
29	Columbus, Ohio	400.0	15.4	152.0	15.2	....	....	....	....	....	....	248.0	0.2
30	Toledo, Ohio	*750.0*	(2)	*250.0*	(2)	*500.0*	(2)	....	....	....	....	....	....
31	Worcester, Mass	422.3	3.8	21.8	3.8	....	....	....	....	10.3	....	390.2	....
32	Atlanta, Ga	309.3	21.5	77.3	5.4	....	....	....	....	....	....	232.0	16.1
33	Syracuse, N. Y	[3] *400.0*	9.3	(2)	9.3	(2)	....	(2)	....	(2)	....	(2)	....
37	Omaha, Nebr	312.6	24.1	127.1	19.0	20.1	....	6.0	....	....	....	159.4	5.1
38	Fall River, Mass	*233.2*	*7.2*	*12.2*	*2.9*	*1.0*	....	....	....	*100.0*	....	*120.0*	*4.3*
39	Memphis, Tenn	300.0	42.0	250.0	42.0	....	....	....	....	....	....	50.0	....
40	Richmond, Va	*232.0*	*15.9*	*40.0*	*2.8*	....	....	....	....	....	....	*192.0*	*13.1*
41	Oakland, Cal	541.0	15.5	541.0	15.5	....	....	....	....	....	....	....	....
43	Nashville, Tenn	*145.5*	*16.7*	*30.0*	*16.7*	*0.5*	....	....	....	....	....	*115.0*	....
45	Cambridge, Mass	[3] 203.7	2.0	(2)	1.1	....	....	....	....	....	....	(2)	0.9

[1] Kinds of materials not reported for a portion of this total.
[2] Not reported.
[3] Kinds of material not reported.
[4] Less than one-tenth of 1 mile.

TABLE 29.—HIGHWAYS—LENGTH (MILES) OF SIDEWALKS AT THE CLOSE OF THE YEAR, CLASSIFIED ACCORDING TO KIND OF SURFACE: 1909—Continued.

[Cities with no reports of sidewalks are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 75. Figures printed in italics are estimates.]

City number.	CITY.	TOTAL.		CEMENT.		FLAGSTONE.		WOOD.		TAR CONCRETE.		ALL OTHER.	
		At close of year.	Laid during year.	At close of year.	Laid during year.	At close of year.	Laid during year.	At close of year.	Laid during year.	At close of year.	Laid during year.	At close of year.	Laid during year.
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.												
47	Albany, N. Y	[1] 179.7	5.4	(2)	0.2	(2)	1.9	...	...	...	...	(2)	3.3
49	Spokane, Wash	481.7	43.7	439.7	43.7	...	...	31.0	...	...	...	11.0	...
50	Hartford, Conn	*250.0*	3.8	...	...	250.0	3.8	...	...	...	...	...	...
57	Salt Lake City, Utah	251.7	84.3	233.6	84.3	1.7	...	...	...	1.6	...	14.8	...
63	St. Joseph, Mo	*225.0*	20.0	*125.0*	12.0	...	...	*40.0*	3.0	...	...	*60.0*	5.0
64	Troy, N. Y	[1] 150.0	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
66	Tacoma, Wash	308.8	41.6	228.0	40.9	...	...	80.8	0.7	...	...	...	...
67	Youngstown, Ohio	*195.0*	10.6	*130.0*	7.6	*65.0*	3.0	...	...	...	...	...	...
68	Duluth, Minn	288.4	28.7	63.2	16.4	...	...	225.2	12.3	...	...	...	...
69	Houston, Tex	*250.0*	[1] 132.3	*75.0*	(2)	*25.0*	(2)	*5.0*	(2)	*5.0*	(2)	*140.0*	(2)
70	Somerville, Mass	121.3	6.0	11.9	1.8	...	...	...	...	...	...	109.4	4.2
71	Kansas City, Kans	*145.5*	8.7	*41.9*	7.5	...	...	*8.0*	...	...	...	*95.6*	1.2
76	Hoboken, N. J	44.2	0.5	11.0	0.5	33.2	...	...	...	...	...	...	...
79	Birmingham, Ala	107.2	2.2	9.7	2.2	...	...	...	...	...	...	97.5	...
80	Akron, Ohio	*125.0*	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
81	Norfolk, Va	[3] *125.0*	(2)	0.1	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
83	Wilkes-Barre, Pa	[1] 57.0	[1] 2.1	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
84	Erie, Pa	102.3	7.3	58.7	7.2	...	...	...	...	...	...	43.6	0.1
86	Peoria, Ill	*213.0*	13.4	*82.0*	12.4	...	...	*3.0*	...	*2.0*	...	*126.0*	1.0
88	Fort Wayne, Ind	240.0	10.0	40.0	10.0	...	...	...	...	...	...	200.0	...
90	Portland, Me	[3] 79.1	2.5	8.5	1.6	...	...	(2)	...	...	...	(2)	0.9
91	Terre Haute, Ind	170.0	27.0	170.0	27.0	...	...	...	...	...	...	...	...
96	Jacksonville, Fla	80.0	(2)	50.0	(2)	...	...	...	...	...	...	30.0	...
97	Oklahoma City, Okla	[1] 135.0	28.1	(2)	25.3	...	...	...	...	...	...	(2)	2.8
99	Covington, Ky	90.0	3.1	71.0	3.1	...	...	1.0	...	...	...	18.0	...
100	South Bend, Ind	*125.0*	2.1	*121.0*	2.1	...	...	...	...	...	...	4.0	...
101	Passaic, N. J	70.4	0.8	...	...	...	...	...	...	...	...	70.4	0.8
102	Altoona, Pa	41.1	3.6	3.0	0.3	1.0	...	...	...	...	...	37.1	3.3
103	Mobile, Ala	*200.0*	1.0	*200.0*	1.0	...	...	...	...	...	...	...	...
105	Pawtucket, R. I	[1] *187.3*	[3] 3.9	(2)	...	(2)	...	(2)	...	(2)	...	(2)	3.3
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.												
106	Saginaw, Mich	[1] *150.0*	8.0	(2)	...	(2)	8.0	(2)	...	(2)	...	(2)	...
107	Canton, Ohio	[1] 102.3	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
108	Wichita, Kans	*450.0*	*36.0*	*450.0*	*36.0*	...	...	...	...	...	...	...	...
110	Binghamton, N. Y	*137.4*	6.9	*91.6*	6.5	*41.8*	0.4	*2.0*	...	...	...	*2.0*	...
113	Little Rock, Ark	*60.0*	5.0	*55.0*	5.0	...	...	...	...	...	...	*5.0*	...
114	Springfield, Ohio	69.6	4.8	69.6	4.8	...	...	...	...	...	...	...	...
115	Atlantic City, N. J	[1] *116.0*	0.9	(2)	0.9	(2)	...	(2)	...	(2)	...	(2)	...
116	Bay City, Mich	*292.5*	13.4	*90.0*	13.4	0.5	...	*200.0*	...	...	...	*2.0*	...
117	Rockford, Ill	[1] *198.0*	10.2	(2)	10.2	(2)	...	(2)	...	(2)	...	(2)	...
119	Lincoln, Nebr	*350.0*	12.4	*280.0*	11.9	...	...	...	...	...	...	70.0	0.5
120	Chattanooga, Tenn	57.0	7.2	42.0	7.2	...	...	...	...	...	...	15.0	...
121	Topeka, Kans	*150.0*	1.7	*5.0*	1.7	2.5	...	...	...	...	...	142.5	...
122	Sacramento, Cal	[1] *160.0*	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
125	Pueblo, Colo	*105.6*	5.4	*79.4*	5.4	20.2	...	...	...	...	...	6.0	...
127	New Britain, Conn	*30.0*	1.3	...	...	30.0	1.3	...	...	...	...	...	...
129	McKeesport, Pa	*40.0*	1.1	*10.0*	0.6	...	...	...	...	...	...	30.0	0.5
130	Wheeling, W. Va	*60.0*	(2)	8.0	(2)	...	...	...	...	...	...	52.0	(2)
132	Superior, Wis	177.7	14.3	51.6	13.9	...	...	126.1	0.4	...	...	...	...
133	Newton, Mass	304.4	3.7	...	...	...	...	3.0	...	95.5	3.7	205.9	...
134	Dubuque, Iowa	[1] *163.0*	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
135	Butte, Mont	42.0	2.5	21.0	2.5	...	...	21.0	...	...	...	...	...
137	Kalamazoo, Mich	106.9	5.0	106.9	5.0	...	...	...	...	...	...	...	...
138	Montgomery, Ala	57.9	1.3	57.9	1.3	...	...	...	...	...	...	...	...
139	Woonsocket, R. I	[1] *96.2*	0.7	(2)	...	(2)	...	(2)	...	(2)	0.1	(2)	0.6
142	Racine, Wis	*104.0*	(2)	100.0	(2)	...	...	2.0	(2)	...	...	2.0	(2)
143	Elmira, N. Y	200.0	5.2	90.0	3.9	30.0	1.0	6.0	...	74.0	0.3	...	...
146	New Castle, Pa	*198.0*	12.0	*130.0*	12.0	*66.0*	...	...	...	...	...	2.0	...
147	Macon, Ga	*25.0*	(2)	...	...	...	...	...	...	*17.0*	(2)	*8.0*	(2)
148	Auburn, N. Y	*128.0*	1.4	*44.1*	1.4	*76.9*	...	*4.0*	...	...	...	*3.0*	...
149	West Hoboken, N. J	35.8	0.1	1.0	0.1	34.8	...	...	...	...	...	...	...
150	Joliet, Ill	130.0	2.0	4.0	2.0	124.0	...	2.0	...	...	...	...	...
151	Taunton, Mass	*146.5*	(2)	0.2	(2)	...	...	...	...	*5.0*	(2)	*141.3*	(2)
152	Everett, Mass	66.2	1.9	5.6	0.7	...	...	...	...	5.9	...	55.6	1.2
153	Oshkosh, Wis	180.0	0.8	54.0	0.8	0.5	...	120.0	...	5.2	...	0.3	...
156	La Crosse, Wis	177.3	1.2	114.5	1.2	...	...	62.0	...	0.8	...	...	...
157	Newport, Ky	52.2	0.5	17.5	0.5	...	...	...	...	...	...	34.7	...

[1] Kinds of material not reported.

[2] Not reported.

[3] Kinds of material not reported for a portion of this total.

TABLE 30.—HIGHWAYS—STATISTICS OF

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see

City number.	CITY.	NUMBER OF BRIDGES.																		
		Total.	Over rail-roads.	Not over rail-roads.	Completed.				Designed for—			Constructed of—					With length—			
					Year not reported.	Before 1890	From 1890 to 1900	From 1900 to 1909	Foot traffic.	Foot and vehicle traffic.	Foot, vehicle, and street car traffic.	Steel or iron.	Wood.	Wood and steel or iron.	Stone.	All other materials.	Not reported.	Of 50 to 100 feet.	Of 100 to 250 feet.	Of 250 to 500 feet.

City number.	CITY.	Total.	Over railroads.	Not over railroads.	Completed: Year not reported.	Completed: Before 1890	Completed: From 1890 to 1900	Completed: From 1900 to 1909	Designed for: Foot traffic.	Designed for: Foot and vehicle traffic.	Designed for: Foot, vehicle, and street car traffic.	Constructed of: Steel or iron.	Constructed of: Wood.	Constructed of: Wood and steel or iron.	Constructed of: Stone.	Constructed of: All other materials.	With length: Not reported.	With length: Of 50 to 100 feet.	With length: Of 100 to 250 feet.	With length: Of 250 to 500 feet.	With length: Of over 500 feet.
	Grand total	2,593	......	......	573	560	657	803	107	1,539	947	1,557	403	170	109	354	113	943	831	341	365
	Group I	1,035	......	......	157	219	231	428	73	578	384	569	121	114	49	182	27	388	340	141	139
	Group II	643	......	......	105	150	201	187	9	386	248	456	79	17	10	81	49	206	201	92	95
	Group III	485	......	......	156	100	125	104	16	295	174	296	118	13	30	28	23	165	159	63	75
	Group IV	430	......	......	155	91	100	84	9	280	141	236	85	26	20	63	14	184	131	45	56

GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.

City number.	CITY.	Total.	Over railroads.	Not over railroads.	Completed: Year not reported.	Completed: Before 1890	Completed: From 1890 to 1900	Completed: From 1900 to 1909	Designed for: Foot traffic.	Designed for: Foot and vehicle traffic.	Designed for: Foot, vehicle, and street car traffic.	Constructed of: Steel or iron.	Constructed of: Wood.	Constructed of: Wood and steel or iron.	Constructed of: Stone.	Constructed of: All other materials.	With length: Not reported.	With length: Of 50 to 100 feet.	With length: Of 100 to 250 feet.	With length: Of 250 to 500 feet.	With length: Of over 500 feet.
1	New York, N. Y	167	87	80	39	15	33	80	13	104	[1] 50	124	37	......	1	5	1	76	55	9	26
2	Chicago, Ill	101	34	67	21	25	21	34	1	26	74	77	8	4	......	12	3	12	46	31	9
3	Philadelphia, Pa	250	125	125	13	71	68	98	10	177	63	91	24	18	44	73	......	96	102	33	19
4	St. Louis, Mo	45	21	24	......	17	12	16	3	28	14	26	7	6	......	6	......	21	12	4	8
5	Boston, Mass	78	48	30	1	29	16	32	7	25	46	9	14	42	......	13	9	21	19	10	19
6	Baltimore, Md	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)
7	Cleveland, Ohio	41	28	13	1	8	8	24	2	26	13	29	4	2	......	6	......	6	12	11	12
8	Pittsburgh, Pa	74	50	24	......	9	29	36	18	31	25	14	7	......	1	52	......	28	16	17	13
9	Detroit, Mich	15	(3)	(3)	5	9	1	......	......	7	8	1	......	14	......	......	14	......	......	......	1
10	Buffalo, N. Y	57	14	43	......	14	21	22	2	31	[1] 24	53	......	2	2	......	......	20	22	7	8
11	San Francisco, Cal	16	11	5	3	......	......	13	1	9	6	13	3	......	......	......	......	4	8	2	2
12	Cincinnati, Ohio	67	12	55	47	......	3	17	14	33	20	50	17	......	......	......	......	43	13	5	6
13	Milwaukee, Wis	41	11	30	......	8	13	20	......	20	21	41	......	......	......	......	......	8	23	4	6
14	Newark, N. J	26	10	16	1	9	......	16	2	16	8	25	......	......	1	......	......	19	3	4	......
15	New Orleans, La	29	(3)	(3)	26	......	......	3	......	27	2	......	......	26	......	3	......	27	......	......	2
16	Washington, D. C	28	8	20	......	5	6	17	......	18	10	16	......	......	......	12	......	7	9	4	8

GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.

City number.	CITY.	Total.	Over railroads.	Not over railroads.	Completed: Year not reported.	Completed: Before 1890	Completed: From 1890 to 1900	Completed: From 1900 to 1909	Designed for: Foot traffic.	Designed for: Foot and vehicle traffic.	Designed for: Foot, vehicle, and street car traffic.	Constructed of: Steel or iron.	Constructed of: Wood.	Constructed of: Wood and steel or iron.	Constructed of: Stone.	Constructed of: All other materials.	With length: Not reported.	With length: Of 50 to 100 feet.	With length: Of 100 to 250 feet.	With length: Of 250 to 500 feet.	With length: Of over 500 feet.
17	Minneapolis, Minn	53	36	17	3	15	24	11	1	35	17	41	4	4	1	3	......	11	19	8	15
18	Los Angeles, Cal	20	5	15	......	5	3	12	......	14	6	13	4	2	......	1	......	2	4	10	4
19	Jersey City, N. J	15	6	9	10	1	3	1	......	8	7	14	1	......	......	......	......	4	8	1	2
20	Kansas City, Mo	40	21	19	......	13	13	14	......	27	13	28	5	2	1	4	......	22	10	1	7
21	Indianapolis, Ind	47	(3)	(3)	1	2	17	27	......	34	13	23	2	......	2	20	......	29	7	9	2
22	Louisville, Ky	6	2	4	......	1	4	1	3	3	......	6	......	......	......	......	......	4	2	......	......
23	Seattle, Wash	9	1	8	......	......	3	6	......	3	6	......	9	......	......	......	......	......	4	2	3
24	Providence, R. I	37	16	21	16	6	11	4	......	14	23	23	10	......	......	4	16	7	12	1	1
25	Rochester, N. Y	45	7	38	......	18	26	1	1	25	19	41	1	......	3	......	......	24	13	4	4
26	St. Paul, Minn	51	37	14	1	18	18	14	......	36	15	37	5	4	1	4	......	7	20	15	9
27	Denver, Colo	21	3	18	......	8	8	5	......	10	11	20	......	......	......	1	......	......	19	......	2
28	Portland, Oreg	10	2	8	......	1	2	7	......	......	10	10	......	......	......	......	......	......	......	5	5
29	Columbus, Ohio	25	9	16	......	8	13	4	......	12	13	20	......	......	......	5	......	3	9	10	3
30	Toledo, Ohio	19	2	17	......	12	4	3	......	8	11	16	2	......	......	1	......	3	14	......	2
31	Worcester, Mass	6	......	6	......	1	4	1	......	3	3	5	......	......	......	1	......	6	......	......	......
32	Atlanta, Ga	13	8	5	......	1	4	8	......	4	9	9	......	......	......	4	......	......	5	2	6
33	Syracuse, N. Y	46	(3)	(3)	32	1	10	3	2	32	[4] 12	43	3	......	......	......	......	44	2	......	......
34	New Haven, Conn	43	20	23	21	10	8	4	1	24	18	31	4	......	......	8	26	6	8	3	......
35	Scranton, Pa	17	7	10	......	2	6	9	......	11	6	13	......	......	......	4	......	3	10	1	3
36	Paterson, N. J	17	(3)	(3)	......	2	3	12	1	13	3	15	......	......	......	2	......	1	7	9	......
37	Omaha, Nebr	22	13	9	13	1	2	6	......	18	4	7	13	2	......	......	1	12	4	......	5
38	Fall River, Mass	9	3	6	......	5	......	4	......	8	1	7	2	......	......	......	......	2	3	1	3
39	Memphis, Tenn	9	9	......	......	......	2	7	......	7	2	2	4	......	......	3	......	1	7	......	1
40	Richmond, Va	1	......	1	1	......	......	......	......	......	1	1	......	......	......	......	1	......	......	......	......
41	Oakland, Cal	4	......	4	......	......	1	3	......	2	2	4	......	......	......	......	......	......	......	3	1
42	Grand Rapids, Mich	16	2	14	......	8	......	8	......	[5] 10	6	10	1	......	......	5	5	4	......	2	5
43	Nashville, Tenn	8	6	2	......	2	4	2	......	6	2	4	......	2	......	2	......	3	......	......	5
44	Lowell, Mass	18	5	13	7	5	4	2	......	9	9	7	6	1	2	2	......	3	10	4	1
45	Cambridge, Mass	7	2	5	......	......	4	3	......	7	......	1	3	......	......	3	......	5	2	......	......
46	Dayton, Ohio	9	......	9	......	4	......	5	......	3	6	5	......	......	......	4	......	......	2	1	6

---

[1] Includes 2 for foot traffic, vehicles, and steam cars.

[2] Incomplete.

[3] Not reported.

BRIDGES OVER 50 FEET IN LENGTH: 1909.

page, 85. For a text discussion of this table, see page 76. Figures printed in italics are estimates.]

NUMBER OF BRIDGES—continued.										Length (feet) of all bridges.	Area (square feet) of all bridges.	COST OF BRIDGE CONSTRUCTION.				City number.
Paved with—					Maintained by—							Total.	Met by—			
Plank.	Wood block.	Asphalt or concrete.	Brick.	All other materials.	City only.	City partly.	Other civil divisions only.	Private corporations and individuals only.	All others.				City.	Private corporations and individuals.	All others.	
1,559	145	334	146	409	1,728	250	233	365	17	722,336	33,122,146	$173,025,518	$124,737,014	$8,886,959	$39,401,545	
574	35	177	29	220	724	112	32	160	7	312,111	16,516,719	129,897,985	104,256,938	4,637,903	21,003,144	
340	70	94	68	71	385	42	84	124	8	176,983	7,938,308	23,039,587	11,060,979	2,596,932	9,381,676	
354	27	27	24	53	325	39	77	44	...	130,114	5,110,282	12,481,011	5,213,898	329,560	6,937,553	
291	13	36	25	65	294	57	40	37	2	103,128	3,556,837	7,606,935	4,205,199	1,322,564	2,079,172	

GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.

Plank.	Wood block.	Asphalt or concrete.	Brick.	All other materials.	City only.	City partly.	Other civil divisions only.	Private corporations and individuals only.	All others.	Length (feet) of all bridges.	Area (square feet) of all bridges.	Total.	City.	Private corporations and individuals.	All others.	City number.
90	10	62	...	5	84	22	...	61	...	72,942	5,286,239	[2] $71,033,777	[2] $71,033,777	(3)	(3)	1
93	1	...	...	7	101	2	...	...	...	26,685	1,320,649	9,025,914	6,099,265	$762,356	$2,164,293	2
63	...	57	4	126	202	...	...	46	2	53,119	2,703,562	14,559,916	10,766,259	378,958	3,414,699	3
26	9	...	7	3	22	15	...	5	3	11,693	457,713	1,471,710	945,870	128,610	397,230	4
43	4	4	1	26	44	34	...	...	...	28,221	1,545,665	10,493,400	5,102,200	1,289,200	4,102,000	5
(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	6
20	1	1	11	8	36	...	...	2	...	19,956	826,821	[2] 4,516,648	3,743,263	...	[2] 773,385	7
44	2	20	2	6	41	14	...	19	...	22,290	802,881	3,725,998	2,039,297	1,642,000	44,701	8
14	1	...	...	...	1	14	...	...	...	2,956	130,000	[2] 295,000	295,000	...	(3)	9
39	...	5	2	11	37	...	16	4	...	15,250	768,665	3,349,297	772,391	85,000	2,491,906	10
10	...	...	...	6	10	...	...	6	...	3,335	141,073	364,779	41,000	321,779	2,000	11
58	3	6	...	...	59	...	...	9	...	13,716	526,926	2,401,000	...	30,000	2,371,000	12
29	1	...	2	9	33	...	...	8	...	17,852	946,867	[2] 2,898,616	2,898,616	(3)	...	13
6	3	11	...	6	...	10	16	...	...	3,172	196,655	651,300	...	...	651,300	14
28	...	1	...	...	29	...	...	...	...	6,630	232,050	641,000	520,000	...	121,000	15
11	...	10	...	7	25	1	...	...	2	14,294	630,953	4,469,630	...	...	4,469,630	16

GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.

Plank.	Wood block.	Asphalt or concrete.	Brick.	All other materials.	City only.	City partly.	Other civil divisions only.	Private corporations and individuals only.	All others.	Length (feet) of all bridges.	Area (square feet) of all bridges.	Total.	City.	Private corporations and individuals.	All others.	City number.
30	15	...	3	5	16	1	...	36	...	21,495	945,010	[2] $2,297,685	$1,879,063	[2] $418,622	...	17
3	...	14	...	3	17	3	...	...	...	8,551	287,920	411,176	104,490	5,244	$301,442	18
9	3	3	...	...	11	...	...	4	...	3,125	136,100	[2] 65,000	...	(3)	65,000	19
28	...	11	...	1	23	11	...	6	...	9,965	362,448	873,019	126,200	627,969	118,850	20
21	2	13	6	5	47	...	...	...	...	7,736	392,378	*1,654,859*	335,596	...	1,319,263	21
5	...	1	...	...	5	...	...	1	...	435	11,075	110,000	95,000	15,000	...	22
9	...	...	...	...	5	4	...	...	...	3,546	138,916	138,200	1,000	23,000	114,200	23
7	...	12	...	18	18	1	...	15	3	4,615	253,375	[2] 1,027,900	[2] 689,900	(3)	[2] 338,000	24
36	...	2	1	6	21	...	17	7	...	7,960	361,621	1,466,438	989,590	9,785	467,063	25
16	10	4	17	4	38	12	...	1	...	22,397	1,041,287	3,122,012	1,707,422	730,162	684,428	26
17	...	3	1	...	21	...	...	...	...	7,596	344,585	905,504	695,504	35,000	175,000	27
2	6	1	...	1	7	...	2	1	...	7,138	363,916	1,725,159	292,275	335,000	1,097,884	28
6	6	2	9	2	6	4	15	...	...	7,053	339,206	1,400,215	504,989	...	895,226	29
17	1	...	1	...	17	...	2	...	...	6,926	287,512	570,650	549,450	...	21,200	30
3	3	...	...	...	6	...	...	...	...	443	19,178	44,370	44,370	...	...	31
2	5	3	2	1	13	...	...	...	...	6,500	366,900	713,728	235,823	121,650	356,255	32
36	2	5	1	2	17	...	29	...	...	3,400	105,652	70,596	...	...	70,596	33
24	2	3	6	8	17	5	...	21	...	2,877	107,288	[2] 409,397	243,417	[2] 16,000	[2] 149,980	34
6	...	9	2	...	17	...	...	...	...	3,844	197,381	461,968	461,968	...	...	35
8	2	1	6	...	...	...	17	...	...	4,223	143,794	502,023	...	*20,000*	482,023	36
19	3	...	...	...	10	...	...	12	...	6,424	288,836	(3)	(3)	(3)	(3)	37
4	...	3	1	1	7	...	1	...	1	3,727	164,561	[2] 1,375,236	70,236	(3)	[2] 1,305,000	38
6	...	2	...	1	1	1	...	7	...	2,175	67,025	*97,500*	*11,000*	*39,500*	47,000	39
...	...	...	...	1	1	...	...	...	...	(3)	(3)	(3)	(3)	(3)	(3)	40
1	...	...	...	3	...	...	1	...	3	2,241	48,872	209,766	...	...	209,766	41
3	5	...	3	5	15	...	...	...	1	4,208	159,274	399,556	399,556	...	...	42
3	2	...	3	...	8	...	...	...	...	9,320	564,730	1,617,500	254,000	200,000	1,163,500	43
8	3	2	1	4	11	...	...	7	...	3,711	180,790	[2] 529,813	529,813	(3)	...	44
7	...	...	...	...	7	...	...	...	...	603	29,594	[2] 90,940	90,940	(3)	...	45
4	...	...	5	...	3	...	...	6	...	4,749	229,084	749,377	749,377	...	...	46

---

[4] Includes 1 for foot traffic, vehicles, and steam cars.

[5] Includes 5 for which the kind of traffic was not reported.

TABLE 30.—HIGHWAYS—STATISTICS OF BRIDGES

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see

City number.	CITY.	NUMBER OF BRIDGES.																			
					Completed.				Designed for—			Constructed of—					With length—				
		Total.	Over railroads.	Not over railroads.	Year not reported.	Before 1890	From 1890 to 1900	From 1900 to 1909	Foot traffic.	Foot and vehicle traffic.	Foot, vehicle, and street car traffic.	Steel or iron.	Wood.	Wood and steel or iron.	Stone.	All other materials.	Not reported.	Of 50 to 100 feet.	Of 100 to 250 feet.	Of 250 to 500 feet.	Of over 500 feet.
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.																				
47	Albany, N. Y	3	1	2			3			3		3									3
48	Bridgeport, Conn	5	1	4		2	1	2		2	3	5							3	1	1
49	Spokane, Wash	14		14			4	10		4	10	6	4			4			5	4	5
50	Hartford, Conn	19	6	13	1	9	6	3		12	7	9	1		7	2		7	11		1
51	Reading, Pa	2	2		1			1		1	1	1				1	2				
52	Trenton, N. J	1		1				1	1			1						1			
53	San Antonio, Tex	27	(2)	(2)	12	7	4	4		21	6	12	15					9	18		
54	New Bedford, Mass	2	1	1			1	1		1	1	2								1	1
55	Camden, N. J	4	(2)	(2)	1			3		2	2	4					4				
56	Dallas, Tex	6	(2)	(2)	6					6		4	2					2	4		
57	Salt Lake City, Utah	7		7			6	1		7		1	6					6			1
58	Lynn, Mass	1		1	1						1		1							1	
59	Wilmington, Del	10	4	6		4	4	2		2	8	10						2	6	1	1
60	Springfield, Mass	10	5	5		4	3	3		10		7	2			1		3	3	1	3
61	Des Moines, Iowa	16	(2)	(2)	2	3	7	4		10	6	11	2			3		3		9	4
62	Lawrence, Mass	18	4	14	2	9	5	2		[3]7	11	13	3		1	1	1	15			2
63	St. Joseph, Mo	21	7	14	19		2		2	17	2	10	11					15	4	2	
64	Troy, N. Y	12	4	8	10		2			8	4	7	1		3	1		10	1	1	
65	Yonkers, N. Y	8	5	3		6		2		6	2	5			3			5	3		
66	Tacoma, Wash	16	6	10		3	11	2		13	3	1	14	1					4	9	3
67	Youngstown, Ohio	10	3	7	1	2	5	2		6	4	10							4	1	5
68	Duluth, Minn	25	3	22	7	6	7	5		15	10	8	17					1	11	6	7
69	Houston, Tex	13		13	12	1				9	4	9	4					1	12		
70	Somerville, Mass	12	9	3		1	4	7		7	5		2	8	2			8	3		1
71	Kansas City, Kans	15	4	11		1	4	10		7	8	14		1				5	1		9
72	Utica, N. Y	26	(2)	(2)	26				7	18	1	22	4					20	5	1	
73	Waterbury, Conn	10	1	9	4	3	3			9	1	9				1		4	5	1	
74	Elizabeth, N. J	14	(2)	(2)	14					11	3	6			8		14				
75	Schenectady, N. Y	14	2	12		2	5	7		12	2	10	4					11	1	1	1
76	Hoboken, N. J																				
77	Manchester, N. H	13	4	9		7	4	2		8	5	8	4		1			9	1	1	2
78	Evansville, Ind	4	(2)	(2)		2	1	1		3	1	4								4	
79	Birmingham, Ala	2	2			1	1			1	1	1	1								2
80	Akron, Ohio	10	6	4		1	5	4		6	4	9				1		8		1	1
81	Norfolk, Va	6	(2)	(2)		1	1	4		2	4	2	2			2		3	1	1	1
82	Fort Worth, Tex	6	3	3	1	1	2	2		[4]6		3	2			1			2	2	2
83	Wilkes-Barre, Pa	3		3		2	1				3	2			1				1		2
84	Erie, Pa	1		1				1			1					1			1		
85	Savannah, Ga																				
86	Peoria, Ill	2		2		1		1		2			2								2
87	Harrisburg, Pa	7	1	6	2	1	1	3		3	4	6				1			5		2
88	Fort Wayne, Ind	11	1	10	11					3	8	10				1			9	2	
89	Charleston, S. C																				
90	Portland, Me	16	9	7	15			1	2	4	10	7	8			1	1	3	7	1	4
91	Terre Haute, Ind																				
92	East St. Louis, Ill	4	1	3	4					3	1	3	1					1	2	1	
93	Holyoke, Mass	17	3	14		8	6	3	1	9	7	13	1	1	1	1		2	13		2
94	Brockton, Mass	8	8				8			4	4	8						8			
95	Johnstown, Pa	8	1	7	1	2	5			2	6	8							6	2	
96	Jacksonville, Fla	2	1	1				2		1	1		1			1				1	1
97	Oklahoma City, Okla																				
98	Bayonne, N. J																				
99	Covington, Ky	2		2	1	1				1	1	1		1			1				1
100	South Bend, Ind	6	(2)	(2)			2	4		5	1	3				3			2	2	2
101	Passaic, N. J																				
102	Altoona, Pa	6	6			4	1	1	3	2	1	3	2	1				1	1	2	2
103	Mobile, Ala																				
104	Allentown, Pa	3	1	2	2			1		1	2	1			2					2	1
105	Pawtucket, R. I	7	2	5		5		2		3	4	4	1		1	1		2	4	1	

[1] Incomplete.

[2] Not reported.

[3] Includes 1 for which the kind of traffic was not reported.

[4] Kind of traffic not reported.

OVER 50 FEET IN LENGTH: 1909—Continued.

page 85. For a text discussion of this table, see page 76. Figures printed in italics are estimates.]

NUMBER OF BRIDGES—continued.										Length (feet) of all bridges.	Area (square feet) of all bridges.	COST OF BRIDGE CONSTRUCTION.				City number.
Paved with—					Maintained by—							Total.	Met by—			
Plank.	Wood block.	Asphalt or concrete.	Brick.	All other materials.	City only.	City partly.	Other civil divisions only.	Private corporations and individuals only.	All others.				City.	Private corporations and individuals.	All others.	
GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.																
			3		2			1		2,384	55,251	$213,840	$155,673	$58,167		47
1	3			1	5					1,502	73,770	422,000	422,000			48
8	1	5			14					6,149	306,054	[1] 887,947	842,930	(2)	$45,017	49
8		5	2	4	13	1		5		3,073	188,422	[1] 2,249,521	275,992	(2)	1,973,529	50
1				1	2					(2)	(2)	(2)			(2)	51
1					1					75	450	1,000			1,000	52
23				4	27					3,077	101,288	178,611	178,611			53
1				1		2				5,319	357,930	1,441,860			1,441,860	54
				4			4			(2)	(2)	(2)			(2)	55
6					6					650	26,500	[1] 15,000	[1] 1,000		14,000	56
7					7					586	10,746	13,706	13,706			57
1							1			480	21,600	(2)		(2)		58
10							6	4		2,082	83,896	[1] 282,600		(2)	282,600	59
8	1			1	6	4				4,817	154,753	[1] 333,100	9,000		[1] 324,100	60
12	4				16					6,409	200,559	655,382	655,382			61
11	5			2	16			2		2,105	107,757	225,687	205,189	20,498		62
21					17	2		2		2,472	53,841	[1] 39,400	5,100	[1] 825	33,475	63
5	1	1	3	2	10			2		1,162	51,140	(2)			(2)	64
4		1		3	1	7				750	(2)	[1] 14,503		(2)	[1] 14,503	65
16					14	2				5,629	225,280	190,012	190,012			66
5	1	4					10			7,234	318,880	550,500			550,500	67
22	2			1	23			2		9,435	410,587	[1] 213,910	[1] 213,910	(2)	(2)	68
12			1		13					1,849	80,870	[1] 75,000	[1] 75,000			69
10				2	1	2		9		1,892	107,473	[1] 238,910		[1] 34,070	204,840	70
15					7	2	4	2		9,103	312,224	835,188	69,162	178,000	588,026	71
22	1			3	4	1	19	2		2,772	83,014	(2)	(2)	(2)	(2)	72
9		1			10					1,713	41,069	(2)	(2)	(2)		73
5		1	1	7			14			(2)	(2)	(2)			(2)	74
14					2		10	2		2,153	65,227	(2)		(2)	(2)	75
																76
8		1		4	13					3,068	66,851	293,450	293,450			77
2			2		3		1			981	36,964	195,607			195,607	78
1	1				1			1		2,000	110,000	[1] 67,680		(2)	67,680	79
6			3	1	10					1,615	81,660	*225,000*	225,000			80
1	2	1		2	4	2				1,761	65,756	[1] *92,400*	75,400	[1] 5,000	12,000	81
4	1			1	6					3,700	204,000	[1] 100,000	12,000		[1] 88,000	82
2				1		1	2			1,750	34,800	[1] 23,000		(2)	23,000	83
	1					1				166	4,160	45,000			45,000	84
																85
2					2					1,900	38,000	55,500	5,500		50,000	86
5	1	1			6		1			3,580	130,000	[1] *300,000*	300,000	(2)	(2)	87
10				1	11					2,397	82,728	279,000	279,000			88
																89
13	1			2	8	1	2	5		6,186	165,000	[1] 400,000	[1] 400,000		(2)	90
																91
3			1		4					590	18,100	115,800	15,800		100,000	92
10	1		5	1	15	2				3,591	162,340	467,278	78,278		389,000	93
8						8				542	24,312	11,853			11,853	94
8					8					1,670	75,750	(2)	(2)			95
1			1		2					1,700	102,000	(2)		(2)		96
																97
																98
2					1		1			786	34,584	[1] 75,000	75,000		(2)	99
1		4	1		6					2,480	88,880	366,000			366,000	100
																101
5		1			4			2		2,321	39,584	52,000		33,000	19,000	102
																103
		1		2	1		2			1,295	57,450	[1] 96,963			[1] 96,963	104
4			1	2	3	1		3		1,163	48,782	[1] 141,803	141,803		(2)	105

TABLE 30.—HIGHWAYS—STATISTICS OF BRIDGES

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see

City number.	CITY.	NUMBER OF BRIDGES.																		
		Total.	Over railroads.	Not over railroads.	Completed.				Designed for—			Constructed of—					With length—				
					Year not reported.	Before 1890	From 1890 to 1900	From 1900 to 1909	Foot traffic.	Foot and vehicle traffic.	Foot, vehicle, and street car traffic.	Steel or iron.	Wood.	Wood and steel or iron.	Stone.	All other materials.	Not reported.	Of 50 to 100 feet.	Of 100 to 250 feet.	Of 250 to 500 feet.	Of over 500 feet.
		GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.																			
106	Saginaw, Mich	6	6	......	......	2	1	3	......	6	......	1	......	5	......	......	......	......	......	1	5
107	Canton, Ohio	18	(1)	(1)	18	......	......	......	......	13	5	17	......	......	......	1	......	17	1	......	......
108	Wichita, Kans	23	(1)	(1)	10	......	......	13	......	22	1	4	7	......	......	12	......	13	7	2	1
109	Springfield, Ill	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
110	Binghamton, N. Y	10	1	9	......	2	5	3	......	4	6	10	......	......	......	......	......	2	......	6	2
111	Lancaster, Pa	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
112	Sioux City, Iowa	41	1	40	41	......	......	......	......	32	9	11	24	4	......	2	......	22	18	1	......
113	Little Rock, Ark	7	6	1	......	4	2	1	......	5	2	6	1	......	......	......	......	......	4	2	1
114	Springfield, Ohio	13	(1)	(1)	......	6	4	3	4	4	5	11	......	......	......	2	......	6	6	1	......
115	Atlantic City, N. J	2	(1)	(1)	......	......	......	2	......	2	......	2	......	......	......	......	......	......	1	1	......
116	Bay City, Mich	7	1	6	......	......	6	1	......	5	2	7	......	......	......	......	......	......	2	3	2
117	Rockford, Ill	14	2	12	2	5	6	1	......	9	5	11	2	1	......	......	......	9	1	2	2
118	York, Pa	9	(1)	(1)	......	2	4	3	......	6	3	8	......	......	......	1	......	......	8	......	1
119	Lincoln, Nebr	5	2	3	......	1	3	1	......	4	1	2	3	......	......	......	......	2	1	1	1
120	Chattanooga, Tenn	8	1	7	......	5	3	......	......	1	7	4	4	......	......	......	......	4	1	2	1
121	Topeka, Kans	18	1	17	17	......	......	1	......	15	3	8	8	......	1	1	......	16	......	......	2
122	Sacramento, Cal	1	......	1	......	......	1	......	......	[2]1	......	......	......	1	......	......	......	......	......	......	1
123	Malden, Mass	1	......	1	......	1	......	......	......	1	......	......	......	1	......	......	......	......	1	......	......
124	Haverhill, Mass	5	1	4	2	2	......	1	[2]1	2	2	4	......	1	......	......	1	......	......	......	4
125	Pueblo, Colo	16	9	7	......	4	5	7	1	10	5	13	2	1	......	......	......	1	7	3	5
126	Salem, Mass	3	......	3	......	1	1	1	......	2	1	1	2	......	......	......	......	......	1	......	2
127	New Britain, Conn	3	3	......	2	......	......	1	......	3	......	1	1	......	1	......	......	3	......	......	......
128	Davenport, Iowa	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
129	McKeesport, Pa	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
130	Wheeling, W. Va	5	2	3	......	3	2	......	......	3	2	4	......	......	1	......	......	......	5	......	......
131	Augusta, Ga	11	(1)	(1)	11	......	......	......	......	2	9	5	1	......	......	5	......	9	......	......	2
132	Superior, Wis	10	(1)	[1]10	9	......	1	......	......	9	1	3	6	1	......	......	......	2	5	1	2
133	Newton, Mass	33	25	8	7	4	18	4	2	22	9	......	......	......	5	28	......	26	6	1	......
134	Dubuque, Iowa	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
135	Butte, Mont	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
136	Chester Pa	12	3	9	12	......	......	......	......	4	8	10	......	......	1	1	12	......	......	......	......
137	Kalamazoo, Mich	4	(1)	(1)	......	2	2	......	......	2	2	2	2	......	......	......	......	1	2	1	......
138	Montgomery, Ala	8	3	5	1	5	1	1	......	7	1	2	4	2	......	......	......	3	5	......	......
139	Woonsocket, R. I	11	......	11	4	1	3	3	......	9	2	3	5	1	1	1	......	3	7	......	1
140	Galveston, Tex	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
141	Fitchburg, Mass	21	3	18	......	9	6	6	......	13	8	13	1	......	5	2	......	15	6	......	......
142	Racine, Wis	9	(1)	(1)	2	5	......	2	......	5	4	8	......	1	......	......	......	......	6	3	......
143	Elmira, N. Y	10	(1)	(1)	......	4	3	3	......	8	2	9	1	......	......	......	......	5	1	......	4
144	Quincy, Ill	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
145	Knoxville, Tenn	20	8	12	......	4	11	5	......	10	10	15	1	......	1	3	......	10	1	2	7
146	New Castle, Pa	11	1	10	1	6	2	2	1	5	5	8	1	......	......	2	1	1	7	2	......
147	Macon, Ga	2	......	2	2	......	......	......	......	2	......	2	......	......	......	......	......	......	1	1	......
148	Auburn, N. Y	8	1	7	......	7	1	......	......	4	4	4	......	1	1	2	......	4	4	......	......
149	West Hoboken, N. J	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
150	Joliet, Ill	16	(1)	(1)	......	2	8	6	......	10	6	13	......	......	3	......	......	5	8	3	......
151	Taunton, Mass	5	......	5	1	2	......	2	......	4	1	3	2	......	......	......	......	1	4	......	......
152	Everett, Mass	1	1	......	......	......	......	1	......	......	1	1	......	......	......	......	......	1	......	......	......
153	Oshkosh, Wis	5	(1)	(1)	4	......	......	1	......	3	2	3	1	1	......	......	......	......	1	2	2
154	Chelsea, Mass	3	3	......	3	......	......	......	......	1	2	......	3	......	......	......	......	3	......	......	......
155	Joplin, Mo	3	3	......	1	......	......	2	......	2	1	2	1	......	......	......	......	......	1	1	1
156	La Crosse, Wis	4	(1)	(1)	2	......	1	1	......	4	......	2	1	1	......	......	......	......	1	2	1
157	Newport, Ky	1	......	1	......	1	......	......	......	......	1	......	......	1	......	......	......	......	......	......	1
158	South Omaha, Nebr	7	7	......	3	1	......	3	......	4	3	3	1	3	......	......	......	......	1	1	5

[1] Not reported.

[2] Incomplete.

OVER 50 FEET IN LENGTH: 1909—Continued.

page 85. For a text discussion of this table, see page 76. Figures printed in italics are estimates.]

NUMBER OF BRIDGES—continued.										Length (feet) of all bridges.	Area (square feet) of all bridges.	COST OF BRIDGE CONSTRUCTION.				City number.
Paved with—					Maintained by—							Total.	Met by—			
Plank.	Wood block.	Asphalt or concrete.	Brick.	All other materials.	City only.	City partly.	Other civil divisions only.	Private corporations and individuals only.	All others.				City.	Private corporations and individuals.	All others.	
GROUP IV—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.																
5	1	...	...	...	6	...	...	...	...	4,278	152,983	$422,600	$422,600	...	...	106
12	...	4	2	...	18	...	...	...	...	1,135	35,260	[2] 10,000	[2] 10,000	...	...	107
8	...	1	3	11	23	...	...	...	...	3,547	99,472	*174,100*	*68,100*	...	*$106,000*	108
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	109
5	...	1	...	4	10	...	...	...	...	3,920	186,826	389,827	339,827	...	50,000	110
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	111
39	1	...	1	...	41	...	...	...	...	4,319	93,874	120,267	120,267	...	...	112
7	...	...	...	...	...	...	1	6	...	3,240	101,450	391,500	...	$41,500	350,000	113
8	2	1	2	...	13	...	...	...	...	1,526	64,366	142,100	142,100	...	...	114
2	...	...	...	...	...	...	2	...	...	449	11,192	52,337	...	...	52,337	115
7	...	...	...	...	6	1	...	...	...	3,043	97,304	349,110	344,110	...	5,000	116
10	4	...	...	...	12	1	...	1	...	3,647	124,518	[2] 146,514	146,514	(1)	(1)	117
8	...	1	...	...	...	...	9	...	...	2,025	59,680	(1)	(1)	(1)	(1)	118
4	1	...	...	...	3	...	...	2	...	3,030	105,600	137,822	4,822	133,000	...	119
7	...	...	1	...	6	...	...	2	...	1,803	68,862	95,864	29,800	6,064	60,000	120
14	...	...	3	1	15	3	...	...	...	3,537	109,672	*249,000*	37,500	...	211,500	121
...	...	...	...	1	...	...	...	1	...	825	30,915	97,200	...	...	97,200	122
1	...	...	...	...	1	...	...	...	...	120	6,000	8,100	8,100	...	...	123
5	...	...	...	...	1	2	2	...	...	3,106	61,962	[2] 136,080	(1)	...	[2] 136,080	124
15	...	1	...	...	8	7	...	1	...	7,326	361,435	433,836	162,580	5,000	266,256	125
3	...	...	...	...	...	3	...	...	...	2,854	114,160	[2] 147,000	...	...	[2] 147,000	126
3	...	...	...	...	...	...	...	3	...	166	3,980	(1)	(1)	(1)	(1)	127
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	128
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	129
4	...	...	1	...	5	...	...	...	...	744	22,332	[2] 162,000	[2] 130,000	...	[2] 32,000	130
6	...	...	...	5	11	...	...	...	...	4,175	127,500	528,000	448,000	80,000	...	131
10	...	...	...	...	8	...	1	1	...	4,555	68,260	836,233	67,233	750,000	19,000	132
7	...	19	...	7	1	29	2	1	...	3,148	126,328	[2] 51,299	...	...	[2] 51,299	133
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	134
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	135
6	...	1	1	4	...	...	12	...	...	(2)	(2)	(1)	(1)	(1)	(1)	136
4	...	...	...	...	4	...	...	...	...	726	24,162	36,035	36,035	...	...	137
...	...	...	...	8	5	...	...	3	...	870	23,972	[2] 2,800	[2] 2,800	(1)	...	138
7	1	...	2	1	11	...	...	...	...	1,830	68,854	*202,379*	*202,379*	...	...	139
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	140
5	...	...	...	16	16	...	...	5	...	1,993	80,353	[2] 260,200	[2] 260,200	...	...	141
9	...	...	...	...	9	...	...	...	...	1,835	50,778	[2] 73,850	73,850	...	(1)	142
8	...	...	1	1	10	...	...	...	...	3,334	119,570	262,208	262,208	...	...	143
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	144
15	...	...	4	1	10	8	1	...	1	7,010	280,622	*549,000*	*133,500*	*85,000*	*330,500*	145
8	...	3	...	...	...	...	10	...	1	1,951	72,384	[2] 146,941	[2] 146,941	...	(1)	146
1	...	...	...	1	1	1	...	...	...	582	15,768	(1)	(1)	...	(1)	147
6	...	1	...	1	8	...	...	...	...	933	43,232	[2] 79,780	79,780	...	(1)	148
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	149
8	...	3	2	3	16	...	...	...	...	2,690	106,913	238,627	206,627	32,000	...	150
5	...	...	...	...	4	1	...	...	...	647	21,125	[2] 52,326	52,326	...	(1)	151
...	...	...	1	...	...	...	...	1	...	85	6,800	90,000	...	...	90,000	152
5	...	...	...	...	5	...	...	...	...	2,332	101,087	[2] 135,000	135,000	...	(1)	153
3	...	...	...	...	...	...	...	3	...	195	10,430	(1)	(1)	(1)	(1)	154
2	1	...	...	...	3	...	...	...	...	1,451	53,472	[2] 75,000	...	...	[2] 75,000	155
3	...	...	1	...	4	...	...	...	...	1,760	48,000	[2] 15,000	15,000	...	(1)	156
1	...	...	...	...	...	1	...	...	...	786	34,584	75,000	75,000	...	...	157
5	2	...	...	...	...	...	...	7	...	5,600	160,800	[2] 232,000	42,000	[2] 190,000	...	158

---

[3] Kind of traffic for which designed not reported.

[4] For foot and railroad traffic.

TABLE 31.—HIGHWAYS—NUMBER OF BRIDGES UNDER 50 FEET IN LENGTH: 1909.

[Cities having no bridges under 50 feet in length are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 77.]

City number.	CITY.	Total number.	CONSTRUCTED OF—						MAINTAINED BY—				
			Iron and steel.	Wood.	Stone.	Concrete.	Reinforced concrete.	All other.	City.	City and other civil divisions.	Other civil divisions.	City and private corporations.	Private corporations.
	Grand total	1,985	460	941	155	46	221	162	1,673	28	48	73	163
	Group I	519	151	150	105	29	32	52	420		7	51	41
	Group II	537	155	222	31	9	81	39	451	1	24	9	52
	Group III	572	88	392	10	6	29	47	512	25	8	2	25
	Group IV	357	66	177	9	2	79	24	290	2	9	11	45
	GROUP I.—CITIES HAVING A POPULATION OF 309,000 OR OVER IN 1909.												
1	New York, N. Y	210	48	40	105	4	3	10	164			34	12
2	Chicago, Ill	3						3	3				
3	Philadelphia, Pa	93	21	21		22	5	24	77				16
4	St. Louis, Mo	62	8	43		3		8	59			2	1
5	Boston, Mass	17	12	4				1	8		1	2	6
6	Baltimore, Md	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
7	Cleveland, Ohio	19	10	1			7	1	13				6
8	Pittsburgh, Pa	8	2	2			2	2	8				
9	Detroit, Mich	2					2		2				
10	Buffalo, N. Y	9	8				1		7			2	
12	Cincinnati, Ohio	41	12	29					40			1	
13	Milwaukee, Wis	8	1	1			6		8				
14	Newark, N. J	28	26					2	12		6	10	
15	New Orleans, La	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
16	Washington, D. C	19	3	9			6	1	19				
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.												
17	Minneapolis, Minn	41	3				10	28	39				2
19	Jersey City, N. J	6	3	3							6		
20	Kansas City, Mo	18	4	13			1		16			1	1
21	Indianapolis, Ind	62	52	5	3		2		62				
22	Louisville, Ky	17	9	2	6				11				6
24	Providence, R. I	24	10	11		1		2	19				5
25	Rochester, N. Y	10	3	1	1	5			7				3
26	St. Paul, Minn	11		7			4		10				1
30	Toledo, Ohio	1	1						1				
31	Worcester, Mass	25	5	7	8		5		25				
33	Syracuse, N. Y	24	5	8	7		4		24				
34	New Haven, Conn	44	6	31				7	23	1			20
35	Scranton, Pa	3	3						3				
36	Paterson, N. J	18	16		1	1					18		
37	Omaha, Nebr	34	1	33					33				1
38	Fall River, Mass	6	5	1					4				2
39	Memphis, Tenn	117		65		2	50		117				
40	Richmond, Va	12		7			5		12				
42	Grand Rapids, Mich	2		1				1	2				
44	Lowell, Mass	28	4	21	2			1	19				9
45	Cambridge, Mass	1		1					1				
46	Dayton, Ohio	33	25	5	3				23			8	2

[1] Not reported.

TABLE 31.—HIGHWAYS—NUMBER OF BRIDGES UNDER 50 FEET IN LENGTH: 1909—Continued.

[Cities having no bridges under 50 feet in length are omitted from this table. For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85. For a text discussion of this table, see page 77.]

City number.	CITY.	Total number.	CONSTRUCTED OF— Iron and steel.	Wood.	Stone.	Concrete.	Reinforced concrete.	All other.	MAINTAINED BY— City.	City and other civil divisions.	Other civil divisions.	City and private corporations.	Private corporations.
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.												
47	Albany, N. Y.	3	3						3				
48	Bridgeport, Conn.	5					5		3	2			
50	Hartford, Conn.	4	2	1	1				2				2
51	Reading, Pa.	8	1	2				5					8
53	San Antonio, Tex.	6		6					6				
55	Camden, N. J.	2	1					1			2		
56	Dallas, Tex.	71		55			11	5	71				
57	Salt Lake City, Utah	107	1	106					107				
58	Lynn, Mass.	6		6					2				4
60	Springfield, Mass.	4	4						4				
62	Lawrence, Mass.	6		4				2	5				1
63	St. Joseph, Mo.	13	2	11					12			1	
64	Troy, N. Y.	8	3		4		1		8				
65	Yonkers, N. Y.	21	1	4		1		15	20				1
67	Youngstown, Ohio.	6	3				2	1			6		
68	Duluth, Minn.	53		53					53				
69	Houston, Tex.	(1)		(1)					(1)				
71	Kansas City, Kans.	16	4	11			1		16				
72	Utica, N. Y.	7	6					1	7				
73	Waterbury, Conn.	24	10	12			2		24				
77	Manchester, N. H.	15	1	13	1				15				
79	Birmingham, Ala.	75		75					75				
81	Norfolk, Va.	5		4			1		5				
83	Wilkes-Barre, Pa.	10	10						4	6			
84	Erie, Pa.	22				3	2	17	22				
85	Savannah, Ga.	12	4	8					12				
87	Harrisburg, Pa.	17	8	4	3	2				17			
90	Portland, Me.	1		1					1				
94	Brockton, Mass.	29	13	11	1		4		28			1	
96	Jacksonville, Fla.	3		3					3				
98	Bayonne, N. J.	7	7										7
105	Pawtucket, R. I.	6	4	2					4				2
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.												
110	Binghamton, N. Y.	6	6						6				
111	Lancaster, Pa.	6	6						6				
112	Sioux City, Iowa.	30		24			6		30				
113	Little Rock, Ark.	3		2			1		3				
114	Springfield, Ohio.	8	3				5		5			3	
117	Rockford, Ill.	10	4	1			5		10				
118	York, Pa.	7					7		7				
119	Lincoln, Nebr.	14		14					14				
120	Chattanooga, Tenn.	1		1					1				
121	Topeka, Kans.	8		6			1	1	8				
123	Malden, Mass.	2	2										2
124	Haverhill, Mass.	20	3	6	4	1	6		13		4		3
125	Pueblo, Colo.	32		32					2				30
126	Salem, Mass.	6		4				2	6				
128	Davenport, Iowa.	5	5						5				
130	Wheeling, W. Va.	6	6						6				
133	Newton, Mass.	14	1		1		1	11	3	1		4	6
135	Butte, Mont.	1		1						1			
137	Kalamazoo, Mich.	8	8						8				
138	Montgomery, Ala.	35		25			10		35				
139	Woonsocket, R. I.	23		14			2	7	22				1
141	Fitchburg, Mass.	13		8	2		1	2	10		3		
143	Elmira, N. Y.	19	2	16	1				18				1
144	Quincy, Ill.	1						1	1				
145	Knoxville, Tenn.	14	5	7			2		10			4	
148	Auburn, N. Y.	4	2	1	1				4				
151	Taunton, Mass.	29	13	14			2		25		2		2
155	Joplin, Mo.	32		1		1	30		32				

---

(1) Not reported.

TABLE 32.—HIGHWAYS—STATISTICS

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85.

City number.	CITY.	EXPENSES OF STREET LIGHTING.			FLAT FLAME GAS LAMPS.			WELSBACH GAS LAMPS.		
		Total.	Per 1,000 square yards of improved streets.	Per capita.	Number.	Cost per lamp per year.	Schedule number of hours lighted per year.	Number.	Cost per lamp per year.[1]	Schedule number of hours lighted per year.[1]
	Grand total	$17,962,574	$47.30	$0.70	34,895			173,507		
	Group I	10,237,224	58.61	0.72	30,171			129,846		
	Group II	3,550,116	36.82	0.70	2,454			28,204		
	Group III	2,720,040	40.61	0.65	1,618			12,862		
	Group IV	1,455,194	34.90	0.69	652			2,595		
	GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.									
1	New York, N. Y	$2,975,400	$77.88	$0.64	86	$14.89	3,950	44,277	$22.37	3,950
2	Chicago, Ill	895,654	36.28	0.42	5,576	15.45	3,786	12,028	17.85	3,786
3	Philadelphia, Pa	1,710,162	86.17	1.12	23,014	(4)	4,000			
4	St. Louis, Mo	655,764	51.85	0.97				18,867	27.20	4,052
5	Boston, Mass	718,332	74.21	1.09	201	22.93	3,828	11,357	35.47	3,828
6	Baltimore, Md	337,273	47.32	0.61				7,483	17.25	4,000
7	Cleveland, Ohio	278,283	35.94	0.52	2	12.09	3,760	8,452	14.88	3,760
8	Pittsburgh, Pa	520,532	68.40	0.99				74	30.00	3,900
9	Detroit, Mich									
10	Buffalo, N. Y	370,590	49.74	0.89				6,684	20.72	3,948
11	San Francisco, Cal	297,107	40.01	0.72				5,297	18.25 23.90	4,015
12	Cincinnati, Ohio	425,064	48.61	1.18				3,027	11.20	3,914
13	Milwaukee, Wis	207,633	26.58	0.58				2,903	22.90	3,814
14	Newark, N. J	228,317	59.78	0.68	1,276	18.00	4,000	703	26.50	4,000
15	New Orleans, La	233,615	49.50	0.70						
16	Washington, D. C	383,498	54.79	1.17	16	18.00	3,760	8,694	20.85	3,760
	GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.									
17	Minneapolis, Minn	$276,510	$127.38	$0.94	19	$22.16	3,958	8,695	$22.16	3,958
18	Los Angeles, Cal	191,156	15.24	0.66						
19	Jersey City, N. J	149,444	61.67	0.57				498	26.50	4,010
20	Kansas City, Mo	138,157	24.28	0.57				[13] 5,319	[12] 9.00 [13] 12.00	4,141
21	Indianapolis, Ind	140,858	28.96	0.62						
22	Louisville, Ky	163,966	39.85	0.74						
23	Seattle, Wash	92,880	31.44	0.42						
24	Providence, R. I	277,989	64.04	1.27				896	28.50	4,015
25	Rochester, N. Y	206,977	65.22	0.98	108	29.20	4,000			
26	St. Paul, Minn	229,782	99.96	1.09				3,980	25.25	4,058
27	Denver, Colo	147,849	51.57	0.71						
28	Portland, Oreg	99,035	23.79	0.52				1,974	(13)	1,825
29	Columbus, Ohio	50,788	13.74	0.30						
30	Toledo, Ohio	73,038	22.85	0.44						
31	Worcester, Mass	127,267	38.52	0.89				538	28.50	4,000
32	Atlanta, Ga	85,915	33.88	0.63						
33	Syracuse, N. Y	102,971	74.93	0.77						
34	New Haven, Conn	88,499	57.75	0.67	46	17.40	4,000	1,346	20.60	4,000
35	Scranton, Pa	68,538	115.15	0.54						
36	Paterson, N. J	78,938	41.90	0.64	367	18.00	3,954	34	30.00	3,954
37	Omaha, Nebr	75,925	29.74	0.62				1,227	22.50	4,000
38	Fall River, Mass	89,627	59.41	0.77				419	26.90	3,924
39	Memphis, Tenn	80,575	22.95	0.69	942	28.80	4,000			
40	Richmond, Va	54,559	21.88	0.47	972	46.23	4,380			
41	Oakland, Cal	90,757	19.11	0.79						
42	Grand Rapids, Mich	40,417	11.35	0.37						
43	Nashville, Tenn	66,867	21.37	0.61						
44	Lowell, Mass	97,643	40.63	0.94				1,415	22.75	4,000
45	Cambridge, Mass	80,960	48.98	0.78				363	28.36	3,900
46	Dayton, Ohio	82,229	72.42	0.82				1,500	22.50	3,831

---

[1] Where two reports are given for a city, unless otherwise noted, they are the highest and lowest figures, indicating the power used, or length of hours, or cost, regulated by one, or both.

[2] Includes oil lamps, as indicated by notes for certain cities.

[3] 3,900 electric arcs (open) and 8,289 electric arcs (closed) were furnished by the city plant for $66.18; the remainder of these were rented at $75.

[4] Furnished to the city free, by the United Gas Improvement Co.

[5] Includes 544 lights, underground circuit, at $90, 3,576 lights, overhead circuit, at $72, and 1,752 lights furnished by the city plant, at $50.98.

[6] For 92 lights, underground circuit, the cost was $75, and for 2,969 lights, overhead circuit, $56.

[7] Meter rates.

[8] Includes 1,764 lights on 14 arches, at $3.43 each, and 1,158 lights on 193 electroliers, at $12.

[9] For overhead wires the cost was $60, and for underground wires $72; the number of each was not reported.

[10] For 200 lights of underground circuit, the cost was $85, and for 2,900 lights, overhead circuit, $69.

OF STREET LIGHTING: 1909.

For a text discussion of this table, see page 80. Figures printed in italics are estimates.]

VAPOR LAMPS.			ELECTRIC ARC LIGHTS (OPEN).				ELECTRIC ARC LIGHTS (INCLOSED).				INCANDESCENT LIGHTS.				City number.
Number.	Cost per lamp per year.	Schedule number of hours lighted per year.	Amperes.[1]	Number.	Cost per light per year.[1]	Schedule number of hours lighted per year.[1]	Amperes.[1]	Number.	Cost per light per year.[1]	Schedule number of hours lighted per year.[1]	Candle-power.[1]	Number.	Cost per light per year.[1]	Schedule number of hours lighted per year.[1]	
38,731				[2] 38,726				134,544				81,605			
31,547				20,828				60,646				14,865			
4,791				[2] 9,597				32,014				32,337			
1,418				5,654				26,083				13,769			
975				[2] 2,647				15,801				20,634			

GROUP I.—CITIES HAVING A POPULATION OF 300,000 OR OVER IN 1909.

Number.	Cost per lamp per year.	Schedule number of hours lighted per year.	Amperes.[1]	Number.	Cost per light per year.[1]	Schedule number of hours lighted per year.[1]	Amperes.[1]	Number.	Cost per light per year.[1]	Schedule number of hours lighted per year.[1]	Candle-power.[1]	Number.	Cost per light per year.[1]	Schedule number of hours lighted per year.[1]	City number.
987	$28.00	3,950					6.6 7.5	15,864	$90.00 100.00	3,950	25 60	8,058	$24.00 28.00	3,950	1
7,021	26.40	3,786	9.0	4,608	[3] $66.18 75.00	4,015	6.6 7.0	8,462	[3] 66.18 [3] 75.00	4,015					2
16,017	29.00	4,000	6.6	12,020	100.00	4,000									3
309	24.11	4,052					6.8	1,263	96.31	4,052	30	270	19.41	4,052	4
			6.6	2,198	129.90	3,828	6.6	1,278	92.39	3,828	40 80	947	19.35 27.85	3,828	5
989	26.00	*4,000*					4.0 6.6	2,529	67.49	*4,000*					6
910	33.21	3,760					*6.6*	2,615	54.96	3,760	*16*	6	14.00	3,760	7
3,643	25.00	3,900					6.6	[5] 5,872	[5] 50.98 [5] 90.00	3,900	60	108	26.00	3,900	8
			9.6	858	32.17	3,874	6.8	3,089	32.17	3,874					9
							6.6	[6] 3,061	[6] 56.00 [6] 75.00	3,948	60	48	(7)	3,948	10
							5.5	2,609	72.00	4,015	16	[8] 2,922	[8] 3.43 12.00	4,015	11
							4.0	5,832	[9] 60.00 [9] 72.00	3,914.					12
313	27.80	3,814	9.6	1,144	65.00	3,814	6.6	1,042	65.00	3,814					13
							7.5	2,627	70.00 270.00	4,000	25 32	186	15.00	4,000	14
							7.5	[10] 3,100	[10] 69.00 [10] 85.00	4,000					15
1,358	22.80	3,760					4.0 6.6	1,403	85.00	3,942	25 200	1,820	20.00 65.00	3,942	16

GROUP II.—CITIES HAVING A POPULATION OF 100,000 TO 300,000 IN 1909.

Number.	Cost per lamp per year.	Schedule number of hours lighted per year.	Amperes.[1]	Number.	Cost per light per year.[1]	Schedule number of hours lighted per year.[1]	Amperes.[1]	Number.	Cost per light per year.[1]	Schedule number of hours lighted per year.[1]	Candle-power.[1]	Number.	Cost per light per year.[1]	Schedule number of hours lighted per year.[1]	City number.
[11] 573	*$25.00*	2,505	9.8	1,201	70.00	3,751	9.8	200	$70.00	3,751	80	430	$14.40	2,258	17
							6.8	2,598	75.60	3,822	8 32	8,430	2.52 10.08	2,374	18
[12] 380	30.00	4,010					4.0	1,691	75.00	4,010					19
							6.6	[13] 1,466	[13] 65.00 [13] 90.00	4,141	(13)	2,095	32.00	2,280	20
497	27.25	3,285	9.6	1,664	74.00	3,285	5.0	100	74.00	3,285	50	1	33.96	3,285	21
							4.5	2,285	74.00	4,000					22
							6.6	596	54.00	4,000	40	[14] 5,044	[14] 9.60 [14] 21.00	4,000	23
			9.6	1,888	100.00	4,015					32	2,335	24.00	4,015	24
							7.5	3,896	[15] 57.95 [15] 68.00	4,000	32	571	19.34	4,000	25
1,619	27.45	4,058					[16] 6.6 [16] 6.0	[16] 874	[16] 85.00 [16] 95.00	4,000	[17] 10 [17] 50	3,898	(17)	[17] 2,258 [17] 4,000	26
			9.6	2,309	60.00	4,000					50	798	28.00	4,000	27
							6.0	1,720	65.50	*3,290*	16	1,670	(18)	1,825	28
							6.9 7.0	2,340	42.17	3,720	60	300	10.50	3,720	29
							5.5	2,135	45.00	4,000					30
1,388	24.78	3,000	4.4	863	91.25	4,000									31
							6.5	1,187	60.00	4,000	8 75	719	6.00 28.00	4,000	32
							5.5	1,597	68.00	4,000					33
							4.0	657	73.00	3,290					34
							6.5	1,059	73.00	4,000					35
			9.6	848	77.50	4,000	9.6	8	77.50	4,000					36
							6.6	1,052	75.00	4,000					37
[12] 221	20.02	3,924	4.0	824	91.25	4,000									38
113	28.80	4,000					7.5	820	75.00	4,000	80	23	30.00	4,000	39
							6.6	866	54.75	3,950					40
							7.5	921	75.60	3,747	16	4,462	3.24 7.20	1,883 3,747	41
							6.6	877	55.91	3,700					42
							6.6	1,240	48.80	4,000	32	572	12.00	3,200	43
							7.5	547	100.00	4,000	32	545	22.50	4,000	44
							6.8	629	90.00	3,900	40	444	25.00	3,900	45
							6.6	653	68.50	3,831					46

[11] Flat flame gasoline.

[12] Oil lamps.

[13] The data on cost per light and for incandescents were as follows: 2,566 Welsbach lamps, at $9, and 2,733 at $12; 1,333 closed arcs (public lights), at $65, and 133 private arcs, at $90. Incandescent lights are on 530 ornamental posts, one globe containing three 100-watt Tungsten lamps and surmounted by one 50-watt lamp. Cost for each post was $32.

[14] For 1,845 lights the cost was $9.60; for 2,980 lights, $13.80; for 194 lights, $13.20; and for 25 lights, $21.

[15] For overhead wires the cost was $57.95, for underground (double), $62.96, and for underground (single), $68; the number of each was not reported.

[16] For 779 lights, overhead wire, 6.6 amperes, the cost was $85, and for 95 underground wire, 6 amperes, $95.

[17] For 4 lights of 32-candlepower on 4,000-hour schedule, the cost was $24. For 177 clusters containing 21 lights of 10 candlepower and one of 50 candlepower, the cost was $95 for each cluster. Those of 10 candlepower burned 2,258 hours, and of 50 candlepower, 4,000 hours.

[18] Paid for by business men, cost not reported.

TABLE 32.—HIGHWAYS—STATISTICS

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85.

City number.	CITY.	EXPENSES OF STREET LIGHTING.			FLAT FLAME GAS LAMPS.			WELSBACH GAS LAMPS.		
		Total.	Per 1,000 square yards of improved streets.	Per capita.	Number.	Cost per lamp per year.	Schedule number of hours lighted per year.	Number.	Cost per lamp per year.[1]	Schedule number of hours lighted per year[1]
	GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.									
47	Albany, N. Y	$85,723	$54.20	$0.86	...	...	...	...	...	...
48	Bridgeport, Conn	62,331	43.03	0.63	...	...	...	473	$25.00	4,000
49	Spokane, Wash	45,745	109.48	0.46	...	...	...	...	...	...
50	Hartford, Conn	60,738	31.90	0.62	...	...	...	...	...	...
51	Reading, Pa	82,929	40.00	0.88	...	...	...	812	25.00	4,000
52	Trenton, N. J	64,094	90.24	0.68	...	...	...	643	29.75	4,000
53	San Antonio, Tex	29,501	8.84	0.32	...	...	...	137	23.33	3,600
54	New Bedford, Mass	67,856	54.01	0.73	...	...	...	1,060	28.00	4,000
55	Camden, N. J	78,472	75.00	0.85	7	$21.00	4,000	530	28.00	4,000
56	Dallas, Tex	53,939	41.16	0.62	...	...	...	...	...	...
57	Salt Lake City, Utah	36,594	43.53	0.42	...	...	...	...	...	...
58	Lynn, Mass	52,809	91.67	0.61	...	...	...	...	...	...
59	Wilmington, Del	43,126	39.42	0.50	...	...	...	665	20.80	4,000
60	Springfield, Mass	90,157	31.72	1.05	...	...	...	...	...	...
61	Des Moines, Iowa	62,881	43.49	0.74	...	...	...	1,119	17.00	4,000
62	Lawrence, Mass	54,803	86.45	0.66	...	...	...	...	...	...
63	St. Joseph, Mo	23,613	16.80	0.31	...	...	...	...	...	...
64	Troy, N. Y	71,049	80.09	0.93	186	27.43	4,000	...	...	...
65	Yonkers, N. Y	108,473	72.36	1.42	...	...	...	2,433	30.00	4,000
66	Tacoma, Wash	53,050	46.51	0.70	...	...	...	...	...	...
67	Youngstown, Ohio	40,924	49.47	0.54	...	...	...	...	...	...
68	Duluth, Minn	36,601	13.07	0.48	...	...	...	174	15.96	*4,000*
69	Houston, Tex	38,295	30.24	0.50	...	...	...	...	...	...
70	Somerville, Mass	52,298	49.76	0.69	...	...	...	...	...	...
71	Kansas City, Kans	48,405	34.42	0.65	...	...	...	844	17.10	4,141
72	Utica, N. Y	49,767	41.67	0.69	...	...	...	...	...	...
73	Waterbury, Conn	44,229	139.94	0.62	...	...	...	...	...	...
74	Elizabeth, N. J	42,690	45.05	0.60	930	15.00	4,000	16	23.00	4,000
75	Schenectady, N. Y	50,361	56.21	0.72	...	...	...	...	...	...
76	Hoboken, N. J	20,279	50.09	0.29	...	...	...	...	...	...
77	Manchester, N. H	63,106	101.70	0.92	...	...	...	144	34.00	3,962
78	Evansville, Ind	41,584	40.01	0.60	...	...	...	567	20.00	4,009
79	Birmingham, Ala	30,081	15.33	0.44	...	...	...	...	...	...
80	Akron, Ohio	49,321	49.21	0.74	...	...	...	884	16.85	*3,650*
81	Norfolk, Va	31,728	31.06	0.48	...	...	...	...	...	...
82	Fort Worth, Tex	17,361	11.75	0.26	...	...	...	...	...	...
83	Wilkes-Barre, Pa	87,448	194.41	1.33	...	...	...	260	29.00	4,000
84	Erie, Pa	50,783	56.65	0.78	...	...	...	512	20.13	4,000
85	Savannah, Ga	18,164	20.93	0.28	...	...	...	...	...	...
86	Peoria, Ill	56,570	48.81	0.91	...	...	...	...	...	...
87	Harrisburg, Pa	26,757	28.17	0.44	...	...	...	...	...	...
88	Fort Wayne, Ind	22,893	27.01	0.38	...	...	...	...	...	...
89	Charleston, S. C	31,725	52.67	0.54	...	...	...	587	24.75	4,000
90	Portland, Me	56,617	25.14	0.98	...	...	...	695	{ 23.00 28.00	1,170 *4,000*
91	Terre Haute, Ind	39,049	22.11	0.68	...	...	...	...	...	...
92	East St. Louis, Ill	28,634	28.15	0.51	...	...	...	...	...	...
93	Holyoke, Mass	30,920	36.99	0.55	...	...	...	...	...	...
94	Brockton, Mass	37,140	76.12	0.67	...	...	...	...	...	...
95	Johnstown, Pa	13,935	33.98	0.26	...	...	...	...	...	...
96	Jacksonville, Fla	35,500	31.44	0.66	...	...	...	...	...	...
97	Oklahoma City, Okla	19,500	11.87	0.37	...	...	...	...	...	...
98	Bayonne, N. J	42,599	80.91	0.80	421	18.00	4,000	...	...	...
99	Covington, Ky	33,910	36.59	0.64	...	...	...	...	...	...
100	South Bend, Ind	43,598	35.08	0.84	...	...	...	...	...	...
101	Passaic, N. J	28,936	52.26	0.56	74	17.00	4,000	...	...	...
102	Altoona, Pa	22,021	51.51	0.43	...	...	...	...	...	...
103	Mobile, Ala	27,056	65.68	0.53	...	...	...	...	...	...
104	Allentown, Pa	28,076	62.26	0.55	...	...	...	...	...	...
105	Pawtucket, R. I	53,296	34.51	1.06	...	...	...	307	22.50	1,800

---

[1] Where two reports are given for a city, unless otherwise noted, they are the highest and lowest figures, indicating the power used, or length of hours, or cost, regulated by one or both.

[2] Candlepower given as 16–32, but no record of the number of each kind. Meter rates.

[3] For 8 lights on 2 clusters the cost was $20 per cluster; for 428 lights, $14.88 per light.

[4] Maintained by business men.

[5] Not reported.

OF STREET LIGHTING: 1909—Continued.

For a text discussion of this table, see page 80. Figures printed in italics are estimates.]

VAPOR LAMPS.			ELECTRIC ARC LIGHTS (OPEN).				ELECTRIC ARC LIGHTS (INCLOSED).				INCANDESCENT LIGHTS.				City number.
Number.	Cost per lamp per year.	Schedule number of hours lighted per year.	Amperes.[1]	Number.	Cost per light per year.[1]	Schedule number of hours lighted per year.[1]	Amperes.[1]	Number.	Cost per light per year.[1]	Schedule number of hours lighted per year.[1]	Candlepower.[1]	Number.	Cost per light per year.[1]	Schedule number of hours lighted per year.[1]	
GROUP III.—CITIES HAVING A POPULATION OF 50,000 TO 100,000 IN 1909.															
			9.0	871	$98.55	4,000									47
95	$25.00	4,000	6.6	623	80.00	4,000									48
							7.5	894	$48.00	4,000	[2] 16 32	102	(2)	4,000	49
							6.2	808	70.00	3,960	75	219	$18.00	3,960	50
			6.5	722	67.50	4,000					32	358	19.20	4,000	51
							6.5	493	85.00	4,000	50	189	27.00	4,000	52
							7.5	330	70.00	3,600	*600*	31	46.66	3,600	53
407	31.50	4,000					5.0	267	97.56	4,000	16	20	25.55	4,009	54
							4.5	797	80.00	4,000	32	191	20.00	4,000	55
							6.5	792	60.00	3,650					56
							4.3	670	60.00	4,000					57
							7.5	340	94.90	*4,000*	25	1,312	15.50	*3,000*	58
			9.6	365	64.92	4,000					16	[3] 436	(3)	4,000	59
							5.0	1,102	71.50 83.00	3,900	32 60	144	7.50 15.00	3,900	60
							6.6	475	65.00	4,000	32	585	17.04	4,000	61
			6.6 9.6	238	80.00 90.00	4,000	6.6	264	90.00	4,000	20	593	20.00	4,000	62
							4.0	607	40.30	3,858	3 30	400	[4] 75.00	1,800 *3,750*	63
							7.5	696	94.90	4,000	8 16	68	(5)	4,000	64
							6.6	300	92.00	4,000	40	598	20.00	4,000	65
							6.6	862	60.00	2,737	[6] 16 80	2,335	(6)	[6] 1,000 *2,737*	66
			6.0	603	68.00	*2,800*									67
							6.0	433	55.00	*4,000*	16	1,182	6.11	*4,000*	68
							6.6	605	70.00	3,650					69
							4.5	490	84.08	3,828	40	678	18.33	3,828	70
319	27.00	4,141					*5.5*	335	65.00	4,141	25	21	20.00	4,141	71
							6.6	916	56.00	4,000					72
							5.5	490	79.00	4,000	25	44	20.00	4,000	73
							6.6	337	80.00	4,000					74
			2.5	830	29.86 73.00	2,000 *4,000*					16	12	31.50	4,000	75
			9.6	288	100.00	4,000									76
75	34.00	4,000					7.5	604	90.00	4,000	[7] 16 32	[7] 703	(7)	[7] *555* 4,000	77
							6.6	459	67.00	4,000	48	24	24.00	4,000	78
							6.6	422	75.00	3,650					79
97	27.00	*3,650*					4.0	403	80.00	*2,737*					80
							6.6	515	58.00	4,000	32	[8] 128	19.61	4,000	81
							6.6	261	46.00	3,000	30	760	12.50	3,000	82
232	31.00	4,000	7.5	491	58.00	4,000					*48*	240	5.00 6.80	2,000 *4,000*	83
							6.6	641	65.70	4,000					84
							6.5	558	30.00	4,000	50	*3*	25.50	4,000	85
							6.0	879	65.00	*3,290*	32	21	10.00	*3,290*	86
							6.0	570	68.00	4,000	25 100	50	22.00 36.00	4,000	87
							4.0	456	53.00	3,200					88
							6.5	248	68.00	4,000	32	11	30.00	*4,000*	89
							6.6	400	60.00	*4,000*	16 65	785	9.00 30.00	*4,000*	90
							4.2	597	70.00	*3,290*					91
							6.6	[9] 394	[9] 100.00	*3,290*					92
							6.6	514	60.00	*4,000*	16	33	12.00	*4,000*	93
							6.6	288	87.00	4,000	30	757	17.00	2,190 *4,000*	94
							6.0	497	50.00	4,000	70	11	25.00	4,000	95
							4.0	566	60.00	4,000	60	260	25.00	4,000	96
							5.0	407	60.00	3,650					97
							9.6	420	80.00	4,000					98
							6.6	724	55.00	4,000	32	86	27.00	4,000	99
							7.5	[10] 542	[10] 78.75 95.00	4,000	50	48	32.00	4,000	100
							6.6	303	85.00	4,000	25	66	15.00	4,000	101
							4.0	435	52.50	4,000	60	20	24.00	4,000	102
							6.5	481	60.00	4,000					103
			9.0	284	84.00	4,000					16	245	18.00	4,000	104
193	22.50	1,800	6.0	339	70.00	2,500	6.0	196	105.00	4,000					105

[6] For 398 lights of 80 candlepower the cost was $21 for a 2,737-hour schedule; 1,937 lights of 16 candlepower were at meter rates.

[7] For 3 Tungsten lamps of 32 candlepower the cost was $90 on a schedule of 4,000 hours; 700 lamps on arches, of 16 candlepower were at meter rates.

[8] Includes 15 free lights.

[9] For 318 lights the city pays $100; 76 lights are furnished free.

[10] For 452 lights, overhead wire, the cost was $78.75 ,and for 90 lights ,underground wire, $95.

TABLE 32.—HIGHWAYS—STATISTICS

[For a list of the cities arranged alphabetically by states, with the number assigned to each, see page 85.

City number.	CITY.	EXPENSES OF STREET LIGHTING.			FLAT FLAME GAS LAMPS.			WELSBACH GAS LAMPS.		
		Total.	Per 1,000 square yards of improved streets.	Per capita.	Number.	Cost per lamp per year.	Schedule number of hours lighted per year.	Number.	Cost per lamp per year.[1]	Schedule number of hours lighted per year.[1]
	GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.									
106	Saginaw, Mich	$23,559	$19.01	$0.47						
107	Canton, Ohio	36,050	67.05	0.74						
108	Wichita, Kans	19,784	42.07	0.41						
109	Springfield, Ill	32,863	27.31	0.67						
110	Binghamton, N. Y	44,724	121.75	0.94						
111	Lancaster, Pa	49,348	55.59	1.06				380	$30.00	4,000
112	Sioux City, Iowa	28,466	53.42	0.50						
113	Little Rock, Ark	11,978	20.44	0.27						
114	Springfield, Ohio	47,406	26.03	1.06				806	24.00	3,650
115	Atlantic City, N. J	53,929	49.67	1.21	206	$15.00	3,650			
116	Bay City, Mich	22,055	32.46	0.50						
117	Rockford, Ill	25,258	20.40	0.57						
118	York, Pa	21,135	38.57	0.48				12	34.50	4,000
119	Lincoln, Nebr	31,008	38.66	0.72						
120	Chattanooga, Tenn	24,786	45.97	0.57						
121	Topeka, Kans	15,505	16.14	0.36						
122	Sacramento, Cal	39,187	25.62	0.90						
123	Malden, Mass	32,897	25.26	0.76						
124	Haverhill, Mass	35,837	98.55	0.83				425	14.00	2,100
125	Pueblo, Colo	32,087	199.27	0.75						
126	Salem, Mass	42,315	43.84	0.99						
127	New Britain, Conn	21,822	54.37	0.51						
128	Davenport, Iowa	38,960	33.03	0.92						
129	McKeesport, Pa	33,616	72.97	0.80						
130	Wheeling, W. Va	27,831	46.81	0.67	10	27.20	3,650			
131	Augusta, Ga	26,463	20.94	0.65						
132	Superior, Wis	17,076	13.02	0.43						
133	Newton, Mass	53,539	15.27	1.36	436	15.00	1,825	600	15.00	1,825
134	Dubuque, Iowa	26,785	21.92	0.69						
135	Butte, Mont	36,413	389.03	0.94						
136	Chester, Pa	25,828	59.08	0.68						
137	Kalamazoo, Mich	17,185	47.32	0.45						
138	Montgomery, Ala	30,601	69.88	0.81						
139	Woonsocket, R. I	21,931	34.70	0.59						
140	Galveston, Tex	23,636	28.54	0.64						
141	Fitchburg, Mass	34,846	122.81	0.94						
142	Racine, Wis	19,579	43.75	0.53						
143	Elmira, N. Y	34,042	36.34	0.92						
144	Quincy, Ill	20,938	25.05	0.57						
145	Knoxville, Tenn	30,341	21.49	0.84						
146	New Castle, Pa	23,680	63.87	0.66						
147	Macon, Ga	20,717	224.06	0.58						
148	Auburn, N. Y	35,336	44.49	1.03						
149	West Hoboken, N. J	16,639	49.65	0.49						
150	Joliet, Ill	27,083	39.90	0.79						
151	Taunton, Mass	3,646	2.90	0.11						
152	Everett, Mass	21,275	39.04	0.65						
153	Oshkosh, Wis	18,410	19.21	0.56						
154	Chelsea, Mass	30,148	45.83	0.93				372	22.00	4,000
155	Joplin, Mo									
156	La Crosse, Wis	17,911	23.76	0.59						
157	Newport, Ky	17,000	30.40	0.56						
158	South Omaha, Nebr	16,740	52.74	0.64						

---

[1] Where two reports are given for a city, unless otherwise noted, they are the highest and lowest figures, indicating the power used or length of hours or cost, regulated by one or both.

[2] 4 to 8 candlepower, for decoration purposes and used only for holiday occasions. Meter rates.

[3] Lights furnished by the city plant for Saturday evenings and holidays for decoration only and no record kept of the cost.

[4] Every dark hour.

OF STREET LIGHTING: 1909—Continued.

For a text discussion of this table, see page 80. Figures printed in italics are estimates.]

VAPOR LAMPS.			ELECTRIC ARC LIGHTS (OPEN).				ELECTRIC ARC LIGHTS (INCLOSED).				INCANDESCENT LIGHTS.				City number.
Number.	Cost per lamp per year.	Schedule number of hours lighted per year.	Amperes.[1]	Number.	Cost per light per year.[1]	Schedule number of hours lighted per year.[1]	Amperes.[1]	Number.	Cost per light per year.[1]	Schedule number of hours lighted per year.[1]	Candlepower.[1]	Number.	Cost per light per year.[1]	Schedule number of hours lighted per year.[1]	
GROUP IV.—CITIES HAVING A POPULATION OF 30,000 TO 50,000 IN 1909.															
......	......	......	......	......	......	......	7.5	402	$60.00	3,650	[2] 4 8	400	(3)	(2)	106
......	......	......	......	......	......	......	6.6	652	41.50 64.00	2,737 *4,000*	......	......	......	......	107
430	$27.00	3,600	......	......	......	......	6.6	273	66.00	2,555	80	24	$10.00	3,600	108
......	......	......	......	......	......	......	6.6	619	48.00	3,850	......	......	......	......	109
......	......	......	......	......	......	......	6.0	443	78.00	4,000	16	512	20.00	4,000	110
75	32.00	4,000	......	......	......	......	4.0	445	80.00	4,000	......	......	......	......	111
......	......	......	......	......	......	......	4.2	89	75.00	3,650	32	900	20.00	3,650	112
......	......	......	......	......	......	......	6.5	335	35.76	2,900	......	......	......	......	113
......	......	......	......	......	......	......	7.5	386	73.00	3,650	......	......	......	......	114
......	......	......	......	......	......	......	6.5	597	75.00	3,650	4 20	11,748	1.21 3.24	913 3,650	115
......	......	......	9.6	135	$55.00	3,800	4.0	311	55.00	3,800	2	380	(3)	(3)	116
......	......	......	......	......	......	......	5.0	507	52.00	*3,650*	......	......	......	......	117
......	......	......	......	......	......	......	4.0	419	49.27	4,000	......	......	......	......	118
......	......	......	......	......	......	......	7.6	347	72.92	*2,600*	......	......	......	......	119
......	......	......	......	......	......	......	6.6	351	70.08	4,000	40	123	18.72	4,000	120
......	......	......	......	......	......	......	6.6	323	40.18	2,391	......	......	......	......	121
......	......	......	9.5	568	75.60	3,800	......	......	......	......	32	11	2.40 6.00	3,800	122
......	......	......	......	......	......	......	6.6	123	100.00	*4,000*	40	1,169	18.75	(4)	123
240	21.00	2,100	......	......	......	......	2.5	203	100.00	4,004	60	5	26.00	4,004	124
......	......	......	......	......	......	......	5.5	376	87.00	*3,700*	60	40	N. R.	*2,000*	125
......	......	......	......	......	......	......	2.5	300	95.00	4,000	30 60	407	22.00	4,000	126
......	......	......	6.6	180	85.00	4,000	......	......	......	......	25	356	20.00	4,000	127
......	......	......	......	......	......	......	4.0	629	57.30	4,000	......	......	......	......	128
......	......	......	......	......	......	......	6.6	451	70.00	*3,650*	......	......	......	......	129
......	......	......	9.6	514	49.00	3,850	......	......	......	......	......	......	......	......	130
......	......	......	......	......	......	......	6.0	390	68.00	4,000	......	......	......	......	131
......	......	......	......	......	......	......	7.5	288	[5] 58.00 65.00	*2,000*	80	102	7.20	*2,000*	132
[6] 24	17.00	1,825	......	......	......	......	5.0	193	90.00	3,650	25	1,419	14.50	1,825	133
......	......	......	......	......	......	......	6.6	414	64.80	2,500	32 50	3	18.00 25.00	3,650	134
......	......	......	......	......	......	......	6.6	344	112.00	3,650	......	......	......	......	135
......	......	......	......	......	......	......	6.0	279	80.00	4,000	16	484	10.50	4,000	136
......	......	......	......	......	......	......	6.6	400	42.50	2,956	......	......	......	......	137
......	......	......	......	......	......	......	6.6	470	51.00	4,000	......	......	......	......	138
......	......	......	10.0	169	120.00	3,650	......	......	......	......	40	64	30.00	3,650	139
......	......	......	9.6	200	*96.00*	3,000	9.6	59	*96.00*	3,000	......	......	......	......	140
......	......	......	......	......	......	......	6.6	332	95.00	3,600	40	230	20.00	3,600	141
......	......	......	4.25	302	54.00 72.00	2,190 3,650	......	......	......	......	32	4	18.00	3,650	142
......	......	......	......	......	......	......	6.6	343	80.00	*4,000*	60	526	16.80 23.10	1,080 4,000	143
......	......	......	......	......	......	......	6.6	388	52.88	2,187	......	......	......	......	144
......	......	......	......	......	......	......	6.6	360	72.50	4,000	25	135	22.50	4,000	145
......	......	......	......	......	......	......	6.6	332	73.01	3,650	......	......	......	......	146
......	......	......	......	......	......	......	7.0	260	36.00 75.00	4,000	......	......	......	......	147
......	......	......	......	......	......	......	6.8	489	68.00	4,000	65	28	34.00	4,000	148
......	......	......	5.00	183	100.00	*4,000*	......	......	......	......	......	......	......	......	149
......	......	......	9.6	396	75.00	*3,600*	......	......	......	......	......	......	......	......	150
160	8.36	2,333	......	......	......	......	6.6	253	25.00	3,887	40 200	822	2.78 12.54	3,887	151
......	......	......	......	......	......	......	6.6	137	88.00	3,012	40	642	15.00	1,661	152
......	......	......	......	......	......	......	6.6	382	48.90	2,737	......	......	......	......	153
46	24.00	4,000	......	......	......	......	6.6	167	84.00	4,000	......	......	......	......	154
......	......	......	......	......	......	......	6.6	257	24.00	3,650	[7] 16 50	74	[7] 2.50 24.00	[7] 4,200 3,650	155
......	......	......	......	......	......	......	6.6	255	[8] 70.00 100.00	[8] 2,737 4,000	......	......	......	......	156
......	......	......	......	......	......	......	6.6	247	65.00	4,000	32	26	27.00	4,000	157
......	......	......	......	......	......	......	6.6	181	75.00	3,650	......	......	......	......	158

[5] For 196 lights, the cost was $65, and for 92 lights $58, being paid under two different contracts.

[6] Oil lamps.

[7] For 65 lights of 16 candlepower, on a schedule of 4,200 hours, the cost was $2.50; and for 9 lights of 50 candlepower, on a schedule of 3,650 hours, $24.

[8] For 6 lights the cost was $100. 29 lights of the entire number were on a schedule of 4,000 hours.

TABLE 33.—SALARIES AND WAGES OF SPECIFIED

[The cities in each state are arranged in the order of their size. The number assigned to each city corresponds with

City number.	GEOGRAPHIC DIVISION, STATE, AND CITY.	Population.	SEWER SERVICE.							REFUSE-DISPOSAL SERVICE.						
			Highest salary paid.	Next highest salary paid.	Salaries of foremen and inspectors.		Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.	Highest salary paid.	Next highest salary paid.	Salaries of foremen and inspectors.		Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.
					Annual.	Daily.						Annual.	Daily.			
	All cities combined	25,603,949	$2,497	$1,624	$988	$3.10	$3.32	$2.03	$1.94	$1,504	$1,010	$913	$2.89	$4.36	$1.95	$1.89
	I.—North Atlantic	12,807,238	2,840	1,746	1,042	3.04	3.42	2.05	1.94	1,648	1,060	943	3.20	6.60	2.08	1.98
	II.—South Atlantic	1,580,124	2,547	1,343	913	3.08	3.10	1.75	1.65	1,754	911	913	2.00	....	1.48	1.50
	III.—North Central	7,832,516	2,215	1,530	925	3.08	3.34	1.97	1.89	1,292	977	845	2.84	2.13	1.96	1.83
	IV.—South Central	1,561,177	2,323	1,672	922	2.92	2.52	1.75	1.72	1,460	1,022	877	2.75	....	1.70	1.70
	V.—Western	1,822,894	2,190	1,615	1,164	5.00	4.43	2.68	2.73	1,568	1,032	1,063	....	....	2.75	2.59

I.—CITIES IN STATES OF THE NORTH ATLANTIC DIVISION.

City number.	GEOGRAPHIC DIVISION, STATE, AND CITY.	Population.	Sewer: Highest salary paid.	Sewer: Next highest salary paid.	Sewer: Foremen and inspectors, Annual.	Sewer: Foremen and inspectors, Daily.	Sewer: Mechanics and skilled laborers.	Sewer: Teamsters.	Sewer: Unskilled laborers.	Refuse: Highest salary paid.	Refuse: Next highest salary paid.	Refuse: Foremen and inspectors, Annual.	Refuse: Foremen and inspectors, Daily.	Refuse: Mechanics and skilled laborers.	Refuse: Teamsters.	Refuse: Unskilled laborers.
	Maine:															
90	Portland	57,824	(1)	$1,400	....	....	....	$2.00	$1.75	$1,200	....	$263	....	....	$1.75	$1.75
	New Hampshire:															
77	Manchester	68,904	$2,200	1,250	....	$2.50	$2.50	1.75	1.75	(1)	(1)	....	(1)	....	(1)	(1)
	Massachusetts:															
5	Boston	657,312	3,500	3,000	....	4.50	4.00	2.25	2.25	3,500	$1,800	1,400	....	....	2.25	2.25
31	Worcester	142,835	2,500	1,700	....	3.75	3.00	2.00	1.85	1,600	780	690	....	....	1.75	1.75
38	Fall River	116,906	3,000	1,725	....	2.95	3.60	2.38	2.25	(1)	(1)	....	(1)	....	2.50	2.50
44	Lowell	104,148	(1)	2,000	....	3.67	2.50	2.00	2.00	1,825	1,082	1,082	....	....	2.00	1.86
45	Cambridge	103,531	3,000	2,000	....	2.58	3.00	2.25	2.00	(1)	1,200	1,100	....	....	2.25	2.00
54	New Bedford	92,718	(1)	(1)	....	3.00	3.00	2.25	2.25	(1)	(1)	....	....	....	2.25	2.25
58	Lynn	87,166	1,200	900	....	3.00	3.00	2.25	2.25	1,200	1,000	1,000	....	....	2.25	2.25
60	Springfield	86,210	1,500	1,014	$1,014	....	....	2.25	2.00	(1)	(1)	1,300	....	....	2.25	2.00
62	Lawrence	83,096	(1)	(1)	....	3.25	5.00	2.00	2.00	1,200	1,100	1,100	....	....	2.00	2.00
70	Somerville	75,830	3,000	1,300	....	3.50	3.65	2.25	2.25	1,400	900	....	$3.00	....	2.25	2.25
93	Holyoke	56,377	(1)	(1)	....	3.00	....	2.14	2.00	(1)	1,200	1,200	(1)	....	2.14	2.00
94	Brockton	55,275	2,500	1,500	1,092	....	3.75	2.75	2.50	1,500	1,200	....	....	....	2.50	2.50
123	Malden	43,280	2,300	1,800	....	2.50	2.50	2.00	2.00	1,600	675	....	....	....	2.25	2.00
124	Haverhill	43,005	(1)	(1)	....	2.50	....	....	2.25	1,800	1,200	....	....	....	2.25	2.25
126	Salem	42,626	2,000	1,000	....	2.88	3.75	2.33	2.33	1,200	900	....	3.00	....	2.25	2.25
133	Newton	39,280	(1)	1,200	....	3.00	2.30	(1)	(1)	(1)	(1)	(1)	....	(1)	(1)	(1)
141	Fitchburg	36,978	(1)	(1)	(1)	....	(1)	(1)	(1)	(1)	(1)	(1)	....	(1)	(1)	(1)
151	Taunton	33,678	1,000	900	900	....	....	2.00	2.25	700	630	....	....	....	2.10	....
152	Everett	32,712	(1)	(1)	....	(1)	....	2.00	2.00	(1)	600	....	....	....	2.00	....
154	Chelsea	32,452	(1)	(1)	....	....	....	2.00	2.00	....	....	....	....	....	....	2.00
	Rhode Island:															
24	Providence	219,715	(1)	(1)	....	2.85	2.67	1.51	1.67	2,000	....		....	....	....	....
105	Pawtucket	50,142	3,000	1,500	780	....	2.67	1.77	1.77	....	....	....	....	....	....	....
139	Woonsocket	37,060	1,100	840	....	....	2.80	(1)	1.67	....	....	....	....	....	....	....
	Connecticut:															
34	New Haven	131,337	2,500	1,800	....	4.50	....	2.00	2.50	....	....	....	....	....	....	....
48	Bridgeport	99,301	(1)	(1)	....	3.75	....	1.50	1.75	(1)	1,040	1,040	....	....	....	....
50	Hartford	97,225	(1)	1,800	....	2.65	5.40	2.00	1.80	....	....	764	....	....	....	2.00
73	Waterbury	71,191	[2] 5,000	1,800	1,152	....	....	2.00	1.75	....	....	....	....	....	....	....
127	New Britain	42,523	1,100	(1)	....	2.70	....	1.90	1.75	....	....	....	....	....	....	....
	New York:															
1	New York	4,629,310	6,000	5,000	1,249	....	5.14	2.45	2.56	7,000	3,500	1,118	....	....	2.52	2.61
10	Buffalo	415,314	4,000	2,400	932	....	3.00	(4)	2.00	(1)	1,200	900	....	....	....	1.33
25	Rochester	211,664	[2] 4,500	[3] 3,600	1,096	....	2.62	2.00	1.84	(1)	(1)	759	....	....	....	1.60
33	Syracuse	133,728	[2] 4,000	1,800	1,800	....	....	1.75	1.70	(1)	1,100	1,100	....	....	1.75	1.70
47	Albany	99,813	[3] 3,500	2,200	....	....	3.15	1.75	1.85	....	....	....	....	....	....	1.75
64	Troy	76,715	[2] 3,500	3,000	....	2.00	....	....	1.50	(1)	(1)	720	....	....	(4)	(4)
65	Yonkers	76,502	(1)	(1)	....	5.00	....	2.25	2.25	(1)	(1)	....	4.50	....	2.25	2.25
72	Utica	72,485	2,500	1,500	....	3.00	....	2.00	2.00	720	....	720	....	....	....	....
75	Schenectady	70,203	1,500	900	....	2.75	5.50	1.75	1.75	....	....	....	....	....	1.75	1.75
110	Binghamton	47,483	2,500	1,600	....	4.00	4.50	1.50	2.25	1,000	450	....	....	....	1.50	1.75
143	Elmira	36,915	1,500	1,200	....	2.25	4.00	1.75	1.75	....	....	....	....	....	....	....
148	Auburn	34,283	(1)	(1)	....	2.00	....	1.50	1.75	....	....	....	....	....	....	....
	New Jersey:															
14	Newark	335,949	[2] 7,500	3,000	1,092	....	3.50	2.50	1.60	1,200	1,000	1,000	....	....	....	....
19	Jersey City	261,482	[2] 5,000	1,200	....	3.50	....	2.00	3.00	....	....	....	....	....	....	....
36	Paterson	123,075	2,500	1,300	....	2.75	2.50	2.00	1.60	....	....	....	2.50	....	....	....
52	Trenton	94,547	2,200	1,200	1,200	....	....	3.00	2.00	1,800	1,000	....	3.00	....	2.00	2.00
55	Camden	92,532	2,500	1,000	....	3.00	....	1.50	1.50	....	....	900	....	....	1.50	1.50
74	Elizabeth	71,138	1,800	1,500	....	3.00	....	1.75	1.75	....	....	....	....	....	....	....
76	Hoboken	69,452	2,000	1,500	....	2.50	....	....	2.50	(1)	(1)	....	(1)	....	....	(1)
98	Bayonne	53,160	3,000	(4)	....	4.00	....	2.00	2.00	(1)	675	....	....	....	2.25	2.00
101	Passaic	51,733	(1)	(1)	720	....	....	2.00	1.50	....	....	....	....	....	....	....
115	Atlantic City	44,613	....	....	....	....	....	....	....	1,200	1,080	1,080	....	....	....	....
149	West Hoboken	34,268	(1)	(1)	(1)	....	....	....	2.00	....	....	....	....	....	....	....
	Pennsylvania:															
3	Philadelphia	1,526,386	[1] 8,000	6,000	1,291	....	3.33	....	....	(1)	(1)	(1)	....	....	....	....
8	Pittsburgh	527,694	2,000	1,500	900	....	3.50	2.25	2.00	....	....	....	....	....	....	....
35	Scranton	127,508	(1)	(1)	....	2.75	....	2.00	1.65	1,500	1,200	....	(1)	....	1.65	2.00
51	Reading	94,555	(1)	(1)	900	....	....	2.00	2.00	600	600	600	....	....	....	....
83	Wilkes-Barre	65,742	2,000	1,400	840	....	2.25	....	1.50	(4)	(4)	....	....	....	1.75	1.50
84	Erie	65,302	(1)	(1)	....	3.00	....	2.50	2.00	....	....	....	....	....	....	....
87	Harrisburg	61,075	1,500	900	....	3.00	....	....	1.67	....	....	....	....	....	....	....
95	Johnstown	53,833	(1)	(1)	....	....	....	1.60	1.60	....	....	....	....	....	....	2.00
102	Altoona	51,287	3,000	1,200	....	2.00	....	2.00	1.60	960	600	....	....	....	2.00	1.60
104	Allentown	50,652	(1)	(1)	....	3.00	....	2.50	2.00	....	....	....	....	$6.60	....	....
111	Lancaster	46,715	(1)	(1)	....	2.00	....	1.50	1.50	....	....	....	....	....	....	....
118	York	43,702	720	700	....	....	....	....	....	....	....	....	....	....	....	....
129	McKeesport	42,032	2,500	1,320	960	....	2.50	2.70	2.00	1,200	900	900	....	....	2.50	2.00
136	Chester	38,134	(1)	(1)	....	....	4.80	2.00	1.75	....	....	....	....	....	....	....
146	New Castle	35,620	2,000	1,200	840	....	....	2.50	1.80	....	....	....	....	....	....	....

---

[1] Salaries and wages for employees not reported here are shown in other columns of the table, owing to the fact that no segregation of employees was made on the pay roll.

CLASSES OF CITY EMPLOYEES: 1909.

that used for the same city in the other tables of this report; see page 85. For a text discussion of this table, see page 82.]

STREET-CLEANING SERVICE.							DUST-PREVENTION SERVICE.							GENERAL HIGHWAY SERVICE.						
Highest salary paid.	Next highest salary paid.	Salaries of foremen and inspectors.		Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.	Highest salary paid.	Next highest salary paid.	Salaries of foremen and inspectors.		Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.	Highest salary paid.	Next highest salary paid.	Salaries of foremen and inspectors.		Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.
		Annual.	Daily.						Annual.	Daily.						Annual.	Daily.			
$1,673	$1,071	$912	$2.76	$2.87	$1.96	$1.84	$1,350	$682	$972	$2.76	......	$2.00	$2.15	$2,644	$1,712	$953	$2.95	$3.11	$1.98	$1.88
1,962	1,067	944	2.93	2.84	2.03	1.86	(1)	663	1,040	2.71	......	2.03	1.84	2,594	1,684	944	2.94	3.19	2.05	1.90
1,775	1,190	811	3.42	2.09	1.54	1.53	1,200	692	858	......	......	1.55	......	2,782	1,571	888	2.73	2.74	1.55	1.53
1,497	1,018	856	2.54	2.70	1.90	1.79	1,040	625	900	2.50	......	1.98	1.75	2,662	1,766	1,008	2.86	3.09	1.94	1.81
1,394	912	853	2.62	2.77	1.72	1.69	1,440	551	750	......	......	1.73	1.75	2,266	1,519	866	2.82	2.72	1.67	1.68
2,066	1,416	1,196	3.20	3.62	2.60	2.50	1,800	942	1,200	3.30	......	2.62	2.83	3,298	2,089	1,149	3.52	3.74	2.61	2.54

I.—CITIES IN STATES OF THE NORTH ATLANTIC DIVISION.

Street-cleaning: Highest salary paid.	Next highest salary paid.	Foremen and inspectors: Annual.	Daily.	Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.	Dust-prevention: Highest salary paid.	Next highest salary paid.	Foremen and inspectors: Annual.	Daily.	Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.	General highway: Highest salary paid.	Next highest salary paid.	Foremen and inspectors: Annual.	Daily.	Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.	City number.
(1)	(1)	......	(1)	(1)	(1)	(1)	......	......	......	......	......	......	......	$2,400	$1,500	......	$2.53	$2.25	$2.00	$1.75	90
(1)	(1)	......	(1)	......	(1)	(1)	(1)	(1)	......	(1)	......	$1.75	......	(1)	(1)	......	(1)	(1)	(1)	(1)	77
(1)	(1)	......	$2.95	......	$2.50	$2.25	(1)	(1)	......	$2.50	......	2.25	$2.25	3,500	3,000	......	4.40	3.75	2.25	2.25	5
(1)	(1)	......	(1)	(1)	(1)	(1)	(1)	(1)	......	(1)	(1)	(1)	(1)	3,000	1,500	......	3.00	3.39	1.75	1.90	31
(1)	(1)	......	3.00	......	2.38	2.25	(1)	(1)	......	(1)	......	2.25	......	(1)	(1)	......	3.00	3.33	2.38	2.25	38
(1)	$1,400	......	2.75	......	2.00	1.75	(1)	$750	......	2.50	......	2.00	......	2,700	(1)	......	3.33	2.65	2.00	2.00	44
(1)	1,350	......	4.50	......	2.25	2.00	(1)	1,200	$1,200	......	......	2.00	......	2,500	1,105	......	4.50	3.75	2.25	2.00	45
(1)	(1)	......	......	......	2.25	2.25	(1)	(1)	......	......	......	2.25	......	2,700	1,500	......	3.00	2.75	2.25	2.25	54
$900	900	......	3.00	......	2.45	2.25	......	......	......	......	......	......	......	1,800	900	......	3.00	2.75	2.45	2.25	58
(1)	(1)	......	3.25	......	2.00	2.25	(1)	1,200	1,200	......	......	2.00	......	2,300	1,500	......	3.33	2.75	2.25	2.00	60
(1)	(1)	......	3.00	......	2.00	2.00	(1)	975	......	3.25	......	2.00	......	2,500	1,500	......	3.25	3.45	2.00	2.00	62
(1)	1,250	$1,070	......	......	2.25	2.25	(1)	675	......	......	......	2.25	......	2,000	1,250	$1,250	......	3.65	2.25	2.25	70
(1)	1,050	1,050	(1)	......	2.14	2.00	(1)	450	......	......	......	1.50	......	[2] 3,500	2,000	......	3.00	3.00	2.14	2.00	93
(1)	(1)	(1)	......	(1)	(1)	(1)	(1)	750	......	......	......	2.50	......	1,750	1,092	1,092	......	3.00	2.50	2.50	94
(1)	(1)	......	......	......	2.00	2.00	(1)	600	......	......	......	2.00	......	(1)	(1)	......	2.50	......	2.00	2.00	123
(1)	(1)	......	2.50	......	2.25	2.25	(1)	(1)	......	(1)	......	2.25	......	1,800	1,500	......	2.50	3.25	2.25	2.25	124
(1)	675	......	2.25	......	2.25	2.25	(1)	(1)	......	(1)	......	(1)	......	1,600	786	......	2.62	2.87	2.33	2.33	126
(1)	(1)	(1)	......	(1)	(1)	(1)	(1)	(1)	(1)	......	......	(1)	(1)	4,000	2,000	450	......	2.98	2.12	2.00	133
(1)	(1)	(1)	......	(1)	(1)	(1)	(1)	(1)	(1)	......	......	2.16	(1)	1,400	912	816	......	2.36	2.16	2.00	141
(1)	(1)	......	......	......	2.00	2.00	......	......	......	......	......	......	......	1,500	750	750	......	2.75	2.33	2.00	151
(1)	(1)	......	(1)	......	2.00	2.00	(1)	(1)	......	2.00	......	2.00	......	1,800	1,600	......	3.25	3.00	2.00	2.00	152
(1)	750	750	......	......	2.25	2.00	(1)	525	......	......	......	1.75	......	1,700	1,100	......	2.58	3.67	2.07	2.00	154
2,400	1,200	......	2.87	$2.25	1.48	1.53	......	......	......	......	......	......	......	[3] 5,000	[2] 4,500	......	2.93	2.42	1.57	1.53	24
(1)	(1)	......	(1)	(1)	(1)	(1)	......	......	......	......	......	1.77	......	(1)	(1)	912	......	3.33	1.77	1.77	105
(1)	(1)	......	(1)	1.67	(1)	(1)	(1)	(1)	......	(1)	......	......	......	1,500	1,050	......	2.50	3.50	1.75	1.67	139
(1)	900	......	2.75	......	2.00	2.00	(1)	(1)	......	(1)	(1)	2.00	2.00	2,750	(1)	......	4.50	......	2.00	2.00	34
1,500	900	900	3.00	......	1.75	1.75	......	......	......	3.00	......	......	......	[2] 4,000	2,500	......	3.00	......	1.75	1.75	48
(1)	1,200	1,000	......	......	1.85	1.85	(1)	(1)	......	......	......	2.00	......	[2] 5,000	2,200	1,000	......	2.60	2.00	1.80	50
(1)	1,200	......	4.00	......	2.00	1.75	(1)	450	......	......	......	1.50	1.50	(1)	(1)	......	3.33	3.25	2.00	1.75	73
(1)	750	......	......	......	1.90	1.75	(1)	(1)	......	(1)	......	(1)	......	2,000	1,800	......	2.67	3.00	1.90	1.75	127
4,700	2,960	1,126	......	4.13	2.32	2.32	(1)	(1)	(1)	......	(1)	(1)	(1)	5,000	5,000	1,252	......	4.35	2.34	2.35	1
(1)	(1)	935	......	......	......	2.00	......	......	(1)	......	......	......	......	(1)	(1)	925	......	......	......	......	10
(1)	(1)	(1)	......	......	1.50	1.60	(1)	(1)	720	......	......	......	......	(1)	(1)	1,200	......	2.85	1.50	1.90	25
(1)	1,900	......	3.00	......	1.75	1.70	(1)	(1)	......	3.00	......	......	......	(1)	(1)	......	......	......	(4)	1.70	33
1,200	750	......	2.50	2.50	1.75	1.75	(1)	(1)	......	......	......	1.75	......	(1)	(1)	......	2.50	3.20	1.75	1.85	47
(1)	(1)	600	......	......	2.00	1.00	(1)	(1)	......	......	......	2.00	......	(1)	(1)	......	1.75	2.00	2.00	1.50	64
(1)	(1)	......	4.50	......	2.25	2.25	(1)	(1)	......	(1)	......	2.25	......	[2] 4,200	[2] 3,500	......	4.83	2.75	2.25	2.27	65
(1)	......	......	2.50	......	......	......	......	......	......	......	......	......	......	(1)	(1)	......	3.00	3.62	2.00	2.00	72
(1)	810	......	2.70	3.00	1.75	1.75	(1)	525	......	......	......	1.75	......	1,850	750	......	2.50	......	1.75	1.75	75
1,200	525	......	......	......	1.50	1.75	(1)	450	......	......	......	1.50	......	(1)	(1)	740	......	......	1.50	1.75	110
(1)	(1)	......	2.00	......	1.75	1.50	......	......	......	......	......	......	......	(1)	(1)	......	2.00	2.50	1.75	1.50	143
(1)	(1)	......	......	......	2.00	1.75	......	......	......	......	......	......	......	2,000	1,500	......	2.25	2.50	2.00	1.75	148
4,000	1,300	1,144	......	3.50	2.50	1.60	(1)	(1)	(1)	......	......	2.50	1.60	3,000	2,000	1,144	......	3.50	2.50	1.60	14
3,000	1,050	1,050	......	......	2.50	2.00	(1)	(1)	......	......	......	2.50	......	(1)	1,800	......	3.00	4.50	2.50	2.50	19
1,500	1,000	......	2.75	......	2.00	1.60	(1)	(1)	......	(1)	......	2.00	......	(1)	(1)	......	2.50	4.00	2.00	1.60	36
1,500	(1)	......	2.50	......	3.50	1.50	(1)	(1)	......	......	......	3.50	......	1,500	1,250	......	3.25	4.00	3.50	1.50	52
(1)	(1)	......	3.50	......	1.50	1.50	(1)	(1)	......	......	......	(1)	......	(1)	(1)	......	3.00	3.00	1.50	1.50	55
(1)	1,050	......	3.50	......	1.75	1.75	(1)	525	......	......	......	1.75	......	(1)	(1)	......	3.00	......	2.00	2.00	74
(1)	750	......	2.50	......	2.00	2.00	......	(1)	......	(1)	......	2.00	......	(1)	(1)	......	(1)	......	......	3.00	76
1,800	675	......	......	......	2.25	2.00	(1)	675	......	......	......	2.25	......	(1)	(1)	......	......	......	......	......	98
(1)	(1)	720	......	......	1.50	1.50	......	450	......	......	......	1.50	......	1,800	1,000	720	......	......	1.50	1.50	101
(1)	(1)	......	2.50	......	2.20	2.20	(1)	660	......	......	......	2.20	......	[2] 4,000	2,500	......	2.50	......	2.20	2.20	115
1,000	900	900	......	......	2.00	2.00	(1)	600	......	......	......	2.00	......	(1)	......	(1)	......	......	......	2.00	149
1,800	1,300	1,300	......	......	......	......	......	......	......	......	......	......	......	(1)	(1)	(1)	......	(1)	......	......	3
4,000	2,000	900	......	......	2.25	2.00	(1)	(1)	(1)	......	......	(1)	(1)	4,000	2,400	1,055	......	3.50	2.25	1.87	8
(1)	(1)	......	2.75	......	2.00	1.65	(1)	(1)	......	(1)	......	2.00	(1)	2,000	1,500	......	2.75	......	2.00	1.65	35
......	......	......	2.50	......	......	......	......	......	......	......	......	......	......	2,600	1,500	792	......	......	1.60	1.60	51
(1)	(1)	......	(1)	......	(1)	(1)	......	......	......	......	......	......	......	(1)	(1)	(1)	......	2.25	2.00	1.50	83
1,500	780	720	......	......	2.50	2.00	......	......	......	......	......	......	......	2,500	1,300	1,000	......	3.00	2.50	2.00	84
(1)	(1)	......	2.75	......	1.50	1.50	......	......	......	......	......	......	......	2,000	(1)	......	2.88	5.50	2.75	1.65	87
(1)	(1)	......	2.00	......	1.60	1.60	(1)	480	......	......	......	1.60	......	2,500	1,080	......	2.00	5.00	1.60	1.60	95
(1)	750	......	2.00	......	2.00	1.60	(1)	(1)	......	(1)	......	2.00	......	(1)	(1)	......	3.50	2.50	2.00	1.70	103
(1)	(1)	......	......	......	......	......	......	780	......	......	......	......	......	3,000	1,200	......	......	......	2.00	2.00	104
(1)	(1)	......	2.50	......	1.50	1.50	......	......	......	......	......	......	......	2,000	1,200	......	2.50	3.50	1.50	1.50	111
800	450	......	......	......	1.50	1.50	......	......	......	......	......	......	......	900	800	......	......	......	1.50	1.50	118
1,320	1,080	......	......	......	2.33	2.00	(1)	(1)	......	......	......	2.33	......	(1)	(1)	(1)	......	2.50	2.00	2.00	129
(1)	(1)	......	3.00	......	2.00	1.50	(1)	(1)	......	(1)	......	2.00	......	2,000	1,200	......	2.50	3.50	2.00	1.50	136
1,200	600	......	......	......	2.00	1.80	(1)	540	......	......	......	1.80	......	(1)	(1)	......	2.75	2.75	2.50	1.80	146

---

[2] City or consulting engineer.

[3] Commissioner of board of public works.

[4] Not reported.

Table 33.—SALARIES AND WAGES OF SPECIFIED

[The cities in each state are arranged in the order of their size. The number assigned to each city corresponds with

City number.	GEOGRAPHIC DIVISION, STATE, AND CITY.	Population.	SEWER SERVICE.							REFUSE-DISPOSAL SERVICE.						
			Highest salary paid.	Next highest salary paid.	Salaries of foremen and inspectors.		Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.	Highest salary paid.	Next highest salary paid.	Salaries of foremen and inspectors.		Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.
					Annual.	Daily.						Annual.	Daily.			
	II.—CITIES IN STATES OF THE SOUTH ATLANTIC DIVISION.															
	Delaware:															
59	Wilmington	86,444	$2,000	$1,320	......	$3.00	$5.00	$1.50	$1.50	......	......	$936	......	......	$1.50	$1.50
	Maryland:															
6	Baltimore	554,095	[2] 4,500	2,400	$929	......	3.50	2.50	2.00	(1)	(1)	735	......	......	1.67	1.67
	District of Columbia:															
16	Washington	326,430	3,000	2,100	......	4.00	3.50	1.50	1.75	(1)	(1)	(1)	......	......	......	1.60
	Virginia:															
40	Richmond	116,053	(1)	1,750	900	......	......	......	2.00	$1,500	$900	......	$2.00	......	2.00	2.00
81	Norfolk	66,492	(1)	(1)	925	......	3.64	1.75	1.75	(1)	1,200	1,200	......	......	1.75	1.75
	West Virginia:															
130	Wheeling	41,396	2,400	675	......	2.25	......	2.00	2.00	2,400	720	720	......	......	......	2.00
	South Carolina:															
89	Charleston	58,564	(1)	(1)	......	......	1.75	1.25	1.25	1,180	......	......	......	......	1.25	1.25
	Georgia:															
32	Atlanta	135,916	2,400	900	900	......	2.00	(1)	1.40	2,400	1,200	960	......	......	1.25	1.10
85	Savannah	64,725	1,127	940	940	......	2.00	1.50	1.40	1,500	1,200	1,200	......	......	1.50	1.25
131	Augusta	40,899	(1)	(1)	(1)	......	(1)	(1)	2.00	1,300	450	......	......	......	1.50	1.50
147	Macon	35,502	(1)	900	900	......	4.00	......	1.25	1,350	900	840	......	......	1.08	1.08
	Florida:															
96	Jacksonville	53,608	2,400	1,100	900	......	2.50	2.00	1.50	2,400	720	720	......	......	1.35	1.35
	III.—CITIES IN STATES OF THE NORTH CENTRAL DIVISION.															
	Ohio:															
7	Cleveland	538,374	$2,000	$1,800	......	$3.61	$3.97	$2.00	$1.91	$3,000	$2,000	......	$3.25	......	$1.93	$1.78
12	Cincinnati	360,454	[2] 4,000	2,400	......	3.50	3.50	2.00	1.75	(1)	(1)	......	3.00	......	2.13	1.75
29	Columbus	168,350	3,000	1,500	......	3.50	2.50	2.38	2.00	1,200	1,050	......	......	......	3.50	2.00
30	Toledo	165,247	(1)	(1)	$1,020	......	2.50	(1)	1.75	(1)	(1)	$1,080	......	......	2.00	......
46	Dayton	100,327	1,500	1,200	......	3.00	3.00	2.00	2.00	(1)	(1)	......	2.50	......	1.75	1.85
67	Youngstown	76,245	(1)	(1)	840	......	......	2.25	......	720	639	......	......	$2.13	......	......
80	Akron	66,733	(1)	(1)	......	2.50	......	1.75	1.75	......	......	......	......	......	......	......
107	Canton	48,927	1,500	1,200	......	2.87	......	1.75	2.00	(1)	(1)	......	2.87	......	......	1.75
114	Springfield	44,688	2,000	2,000	......	......	3.83	(1)	1.93	(1)	1,200	1,200	......	......	1.93	1.93
	Indiana:															
21	Indianapolis	228,690	1,800	1,200	792	......	3.00	2.00	2.00	......	......	......	......	......	......	......
78	Evansville	68,747	(1)	(1)	......	2.50	......	(1)	1.60	(1)	925	......	......	......	1.67	1.67
88	Fort Wayne	60,925	2,000	1,500	900	......	......	1.60	1.60	(1)	780	......	......	......	......	2.00
91	Terre Haute	57,316	1,500	1,500	......	......	......	2.00	2.00	1,125	1,125	1,125	......	......	......	......
100	South Bend	52,087	2,000	1,200	762	......	......	1.75	1.75	(1)	900	......	......	......	1.75	2.50
	Illinois:															
2	Chicago	2,142,156	4,000	2,500	1,344	......	4.54	2.00	2.00	(1)	(1)	......	2.30	......	2.00	2.00
86	Peoria	62,095	1,200	1,200	......	3.00	4.66	1.75	2.00	......	......	......	......	......	......	......
92	East St. Louis	56,682	2,400	1,500	720	......	3.29	1.50	1.60	1,500	720	720	......	......	1.50	1.50
109	Springfield	48,799	2,000	900	......	5.00	......	2.00	1.75	1,000	900	900	......	......	......	......
117	Rockford	44,240	1,650	1,200	......	2.25	......	2.00	1.85	900	600	......	2.00	......	......	......
144	Quincy	36,557	1,700	1,000	......	2.00	3.00	......	......	720	720	720	......	......	......	1.40
150	Joliet	34,198	1,800	1,500	......	......	......	......	1.75	(1)	(1)	......	......	......	1.75	1.75
	Michigan:															
9	Detroit	447,484	[2] 4,000	2,000	......	......	......	......	2.00	1,100	......	......	2.75	......	2.00	1.75
42	Grand Rapids	110,060	[2] 4,000	2,400	978	......	2.50	2.00	1.89	2,000	1,350	702	......	......	2.25	2.00
106	Saginaw	49,929	2,500	1,800	......	2.50	3.00	1.90	1.90	(1)	(1)	......	......	......	......	......
116	Bay City	44,492	1,400	(1)	......	2.50	3.00	......	......	(1)	(1)	......	......	......	......	1.10
137	Kalamazoo	37,999	2,000	1,200	......	2.50	2.50	1.80	1.80	1,000	720	660	......	......	1.50	......
	Wisconsin:															
13	Milwaukee	359,060	1,500	(4)	......	3.50	3.00	2.00	1.75	1,200	1,200	(4)	......	......	2.00	1.75
132	Superior	39,695	1,500	900	840	......	......	2.25	2.25	900	900	900	......	......	......	2.25
142	Racine	36,976	(1)	(1)	(1)	......	......	(1)	(1)	......	......	......	......	......	......	......
153	Oshkosh	32,615	(1)	(1)	......	(1)	(1)	(1)	(1)	......	......	......	......	......	......	......
156	La Crosse	30,176	(4)	(4)	......	......	......	......	2.25	(4)	(4)	......	......	......	1.75	......
	Minnesota:															
17	Minneapolis	294,330	2,700	1,500	......	3.50	2.63	2.00	2.00	3,300	......	1,200	......	......	2.00	2.00
26	St. Paul	211,563	3,600	1,800	......	3.00	3.44	2.00	1.90	1,290	950	950	......	......	2.00	1.35
68	Duluth	76,038	(4)	(4)	816	......	......	3.00	2.40	1,200	1,200	720	......	......	2.25	2.00
	Iowa:															
61	Des Moines	84,592	3,000	2,100	......	3.00	4.00	2.25	2.25	1,650	1,200	840	......	......	......	2.25
112	Sioux City	46,690	2,000	1,800	1,200	......	2.50	1.75	1.75	900	900	900	......	......	......	2.00
128	Davenport	42,495	1,800	1,500	......	4.00	3.00	2.00	1.75	1,200	720	720	......	......	1.75	2.00
134	Dubuque	39,065	2,000	900	......	......	......	......	......	780	600	780	......	......	......	1.80
	Missouri:															
4	St. Louis	677,123	3,500	2,500	......	2.91	4.30	2.17	2.02	2,400	2,400	......	3.26	......	1.67	1.98
20	Kansas City	241,767	1,800	1,350	......	3.57	5.60	1.75	1.71	900	750	......	2.50	......	......	1.67
63	St. Joseph	[3] 77,403	1,200	900	840	......	2.25	1.75	1.75	900	780	840	......	......	......	1.67
155	Joplin	31,935	1,800	950	......	2.50	2.50	......	......	720	600	600	......	......	......	......
	Nebraska:															
37	Omaha	122,187	3,000	2,000	......	3.50	4.80	2.00	2.00	......	......	......	4.00	......	......	......
119	Lincoln	43,635	1,800	1,500	900	......	......	1.75	1.75	1,200	900	720	......	......	......	......
158	South Omaha	26,235	1,800	1,200	......	3.50	......	(1)	(1)	......	......	......	......	......	......	......
	Kansas:															
71	Kansas City	74,798	(1)	(1)	......	2.88	......	......	1.73	780	620	620	......	......	......	1.67
108	Wichita	48,806	1,800	1,800	1,200	......	......	1.75	1.75	......	......	......	......	......	......	......
121	Topeka	43,531	1,620	1,200	720	......	......	2.00	2.00	......	......	......	......	......	......	......

---

[1] Salaries and wages for employees not reported here are shown in other columns of the table, owing to the fact that no segregation of employees was made on the pay roll.

[2] City or consulting engineer.

CLASSES OF CITY EMPLOYEES: 1909—Continued.

that used for the same city in the other tables of this report; see page 85. For a text discussion of this table, see page 82.]

STREET-CLEANING SERVICE.							DUST-PREVENTION SERVICE.							GENERAL HIGHWAY SERVICE.							
Highest salary paid.	Next highest salary paid.	Salaries of foremen and inspectors.		Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.	Highest salary paid.	Next highest salary paid.	Salaries of foremen and inspectors.		Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.	Highest salary paid.	Next highest salary paid.	Salaries of foremen and inspectors.		Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.	City number.
		Annual.	Daily.						Annual.	Daily.						Annual.	Daily.				
II.—CITIES IN STATES OF THE SOUTH ATLANTIC DIVISION.																					
(1)	$936	$936	....	....	$1.50	$1.50	(1)	$936	$936	....	....	$1.50	....	$2,000	(1)	....	$3.00	....	$1.50	$1.50	59
$2,500	2,400	735	....	....	1.67	1.67	$1,200	780	780	....	....	1.67	....	(1)	(1)	(1)	....	....	(1)	(1)	6
2,500	1,600	1,100	....	$2.53	1.50	1.50	(1)	(1)	(1)	....	....	1.75	....	3,000	$2,250	$1,200	....	$2.25	1.50	1.50	16
(1)	(1)	....	$2.00	....	2.00	2.00	....	....	....	....	....	....	....	[2]4,500	(1)	965	....	2.19	2.00	2.00	40
1,600	1,200	720	....	1.75	1.75	1.75	(1)	525	....	....	....	1.75	....	[2]4,800	2,400	....	2.95	3.25	1.50	1.75	81
(1)	(1)	....	2.25	....	2.00	2.00	....	....	....	....	....	....	....	1,200	1,000	....	2.25	3.20	2.00	2.00	130
1,200	900	900	....	2.00	1.25	1.25	(1)	(1)	(1)	....	....	1.25	....	2,500	1,400	720	....	2.75	1.25	1.25	89
1,500	960	960	....	....	1.25	1.10	(1)	(1)	(1)	....	....	1.25	(1)	3,000	(1)	900	....	2.50	1.50	1.35	32
1,350	625	625	....	....	1.50	1.50	(1)	(1)	(1)	....	....	1.50	....	2,400	1,500	800	....	2.40	1.50	1.40	185
(1)	(1)	600	....	....	1.00	1.50	(1)	(1)	(1)	....	....	1.50	(1)	[3]3,600	1,500	600	....	2.35	1.50	1.50	131
(1)	900	....	3.00	....	1.25	1.25	(1)	(1)	....	(1)	....	(1)	....	1,800	1,200	1,200	....	4.00	1.25	1.25	147
(1)	(1)	720	....	....	1.75	1.35	(1)	525	....	....	....	1.75	....	1,800	1,320	720	....	2.50	1.50	1.35	96
III.—CITIES IN STATES OF THE NORTH CENTRAL DIVISION.																					
$2,000	$1,800	....	$2.85	$3.03	$2.00	$1.71	....	....	....	....	....	....	....	$2,500	$2,200	....	$3.55	$3.45	$2.00	$1.30	7
3,200	1,800	....	3.00	3.00	2.13	1.75	....	....	....	....	....	....	....	(1)	2,100	....	3.00	3.00	2.13	1.75	12
1,200	900	$900	....	3.00	2.50	2.00	(1)	(1)	(1)	....	....	$2.50	....	2,700	2,400	....	3.50	3.00	2.50	2.00	29
(1)	(1)	900	....	....	(1)	1.62	....	....	....	....	....	....	....	2,180	1,500	$900	....	2.50	2.00	....	30
1,800	1,100	1,100	....	2.75	1.75	1.75	....	....	....	....	....	....	....	2,700	2,000	1,350	....	2.75	2.00	1.75	46
1,320	675	....	2.25	....	2.25	1.80	....	....	....	....	....	....	....	2,900	1,800	900	....	2.50	2.25	1.80	67
(1)	(1)	....	....	....	1.75	1.75	(1)	$750	....	$2.50	....	1.75	....	1,800	1,500	....	2.50	....	1.75	1.75	80
1,000	525	....	....	....	1.75	1.75	....	....	....	....	....	....	....	(1)	(1)	....	3.00	....	(1)	(1)	107
(1)	1,200	1,200	....	1.93	1.93	1.93	....	....	....	....	....	....	....	(1)	(1)	1,200	....	3.82	1.93	1.93	114
1,500	1,200	991	....	3.00	1.66	1.60	(1)	(1)	$900	....	....	....	....	1,800	1,800	818	....	3.00	1.75	1.70	21
(1)	1,500	....	3.00	....	1.60	1.60	....	(1)	....	....	....	1.60	....	2,000	1,500	....	2.83	3.00	1.66	1.60	78
(1)	(1)	....	....	....	1.60	1.36	....	....	....	....	....	....	....	(1)	900	....	....	....	1.60	1.36	88
1,200	900	....	....	....	2.00	2.00	....	....	....	....	....	....	....	(1)	(1)	....	....	....	2.00	2.00	91
(1)	(1)	....	....	....	1.75	1.75	(1)	(1)	....	....	....	....	....	(1)	(1)	(1)	....	....	(1)	(1)	100
(1)	(1)	....	2.25	....	2.00	2.00	....	....	....	....	....	....	....	5,000	3,000	1,800	....	3.98	2.00	2.00	2
(1)	780	780	....	....	1.75	1.75	(1)	525	....	....	....	1.75	....	1,200	1,000	....	3.52	3.17	1.75	2.10	86
(1)	720	720	....	....	1.50	2.00	(1)	(1)	(1)	....	....	1.50	....	(1)	1,000	780	....	3.29	1.50	1.50	92
1,200	900	....	....	....	2.00	1.75	(1)	600	....	....	....	2.00	....	(1)	(1)	....	(1)	....	(1)	(1)	109
(1)	630	....	2.10	....	1.67	1.33	....	....	....	....	....	....	....	(1)	(1)	900	....	....	2.00	2.20	117
(1)	(1)	....	2.00	....	1.75	1.75	....	....	....	....	....	....	....	(1)	(1)	....	(1)	(1)	(1)	(1)	144
(1)	(1)	....	....	....	1.75	1.75	....	....	....	....	....	....	....	(1)	(1)	....	....	....	....	1.75	150
1,800	825	....	2.75	....	2.00	1.75	(1)	(1)	....	....	....	2.00	....	1,400	1,100	1,025	....	3.75	....	1.75	9
(1)	(1)	(1)	....	....	1.80	1.75	(1)	(1)	....	....	....	1.80	....	(1)	(1)	....	2.70	2.50	1.80	1.80	42
(1)	(1)	....	(1)	(1)	(1)	(1)	(1)	(1)	....	(1)	....	....	....	(1)	(1)	....	(1)	(1)	(1)	(1)	106
1,200	1,000	....	....	2.05	1.80	1.80	(1)	540	....	....	....	1.80	....	(1)	(1)	....	....	....	....	....	116
1,200	720	720	....	....	2.00	2.00	(1)	(1)	(1)	....	....	2.00	(1)	(1)	(1)	(1)	(1)	....	(1)	(1)	137
(1)	(1)	....	(1)	(1)	(1)	(1)	(1)	(1)	....	(1)	....	(1)	....	(1)	(1)	....	3.00	3.00	2.00	1.75	13
(1)	(1)	....	....	....	2.25	2.25	(1)	(1)	(1)	....	....	2.25	....	(1)	(1)	840	....	2.50	2.25	2.25	132
1,000	1,000	....	2.25	....	2.15	1.65	....	....	....	....	....	....	....	2,000	(1)	(1)	....	....	(1)	(1)	142
(1)	(1)	....	....	....	2.00	1.50	....	....	....	....	....	....	....	1,000	836	....	1.75	2.25	2.00	1.50	153
(4)	(4)	....	2.38	....	1.75	1.75	(1)	600	....	....	....	2.00	....	(4)	(4)	....	2.00	....	2.00	1.75	156
1,900	1,800	....	....	3.25	2.00	2.00	(1)	(1)	....	....	....	3.25	....	[2]5,000	3,000	....	3.39	2.69	2.00	2.00	17
2,400	900	....	3.00	....	2.00	1.51	(1)	(1)	900	....	....	2.00	....	[5]5,000	2,000	....	2.44	2.13	2.00	1.61	26
840	840	840	....	....	2.00	2.00	$900	....	900	....	....	....	....	[4]5,000	(4)	804	....	3.00	2.00	2.00	68
1,200	900	900	....	....	2.25	2.25	....	....	....	....	....	....	....	(1)	(1)	....	(1)	(1)	(1)	(1)	61
1,200	900	900	....	....	1.75	1.75	(1)	600	....	....	....	2.00	....	(1)	(1)	(1)	....	....	1.75	1.75	112
1,200	900	....	2.50	....	1.75	1.75	(1)	(1)	....	(1)	....	1.75	....	(1)	(1)	....	3.00	....	2.00	1.75	128
1,200	720	600	....	....	2.15	1.80	720	640	....	....	....	2.15	....	(1)	(1)	....	....	....	....	....	134
1,800	1,800	....	2.52	2.25	2.00	1.50	1,500	750	....	2.50	....	2.00	....	4,000	2,500	....	2.73	4.02	2.00	1.87	4
2,500	1,500	....	2.50	....	1.75	1.74	(1)	(1)	....	2.50	....	1.75	$1.75	3,000	1,800	....	3.63	3.30	1.75	1.73	20
1,080	780	720	....	....	1.75	1.75	....	....	....	....	....	....	....	2.400	1,380	780	....	3.38	1.75	1.73	63
1,080	720	720	....	....	2.00	2.00	....	....	....	....	....	....	....	(1)	(1)	....	2.50	2.50	2.00	2.00	155
2,000	1,200	....	2.75	....	2.00	2.00	....	....	....	....	....	....	....	(1)	(1)	....	3.42	4.80	2.00	2.00	37
1,200	840	....	2.50	....	1.75	1.75	(1)	(1)	....	....	....	1.75	....	(1)	(1)	....	2.50	....	1.75	1.75	119
(1)	(1)	....	....	....	2.00	2.00	....	....	....	....	....	....	....	(1)	(1)	....	3.50	....	(1)	(1)	158
1,200	720	....	2.50	....	1.98	1.75	....	....	....	....	....	....	....	2,000	(1)	....	2.77	3.00	2.00	1.74	71
1,500	900	....	....	....	1.75	1.75	....	....	....	....	....	....	....	(1)	(1)	....	1.75	....	(1)	(1)	108
(1)	(1)	(1)	....	....	2.00	2.00	(1)	(1)	....	....	....	2.00	....	(1)	(1)	(1)	....	....	2.00	2.00	121

---

[3] Commissioner of board of public works.
[4] Not reported.
[5] Commissioner of department of public works.
[6] Population for April 15, 1910; estimate for 1909 can not be made

TABLE 33.—SALARIES AND WAGES OF SPECIFIED

[The cities in each state are arranged in the order of their size. The number assigned to each city corresponds with

City number.	GEOGRAPHIC DIVISION, STATE, AND CITY.	Population.	SEWER SERVICE.							REFUSE-DISPOSAL SERVICE.						
			Highest salary paid.	Next highest salary paid.	Salaries of foremen and inspectors.		Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.	Highest salary paid.	Next highest salary paid.	Salaries of foremen and inspectors.		Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.
					Annual.	Daily.						Annual.	Daily.			
	IV.—CITIES IN STATES OF THE SOUTH CENTRAL DIVISION.															
	Kentucky:															
22	Louisville	222,293	[1] $6,000	$5,000	....	$3.00	$3.00	$1.75	$1.75	$1,500	$1,100	$900	....	....	$1.75	$1.75
99	Covington	52,720	2,100	1,800	$825	....	....	1.75	1.75	(2)	(2)	....	....	....	1.88	1.75
157	Newport	30,130	1,800	1,200	....	3.00	....	1.75	1.75	(2)	(2)	....	....	....	1.75	1.75
	Tennessee:															
39	Memphis	116,706	1,800	1,200	975	....	1.75	2.00	1.50	1,200	1,200	....	....	....	1.63	2.00
43	Nashville	109,619	(2)	(2)	1,080	....	....	....	....	1,800	720	720	....	....	2.00	2.00
120	Chattanooga	43,634	2,400	1,800	....	2.50	....	1.25	1.25	(2)	1,200	....	$2.75	....	1.25	1.25
145	Knoxville	36,017	(2)	(2)	(2)	....	(2)	(2)	(2)	1,500	1,080	....	....	....	1.25	....
	Alabama:															
79	Birmingham	68,600	1,500	900	900	....	....	1.25	1.25	1,200	780	780	....	....	1.25	1.25
103	Mobile	51,250	(2)	1,910	840	....	....	1.75	2.00	(2)	(2)	....	....	....	2.00	2.00
138	Montgomery	37,888	(2)	(2)	....	3.00	....	1.00	1.00	(2)	(2)	880	....	....	1.00	1.00
	Louisiana:															
15	New Orleans	334,470	2,400	1,800	900	....	3.00	2.00	2.00	(2)	(2)	780	....	....	2.00	2.00
	Texas:															
53	San Antonio	92,777	2,000	1,500	720	....	3.00	....	....	840	840	840	....	....	1.50	1.50
56	Dallas	87,606	2,400	1,200	....	3.00	2.50	....	2.00	....	....	900	....	....	2.00	2.00
69	Houston	75,949	3,000	1,500	1,200	....	2.75	2.00	2.00	1,800	600	....	....	....	2.00	2.00
82	Fort Worth	66,420	2,400	1,200	670	....	....	2.50	2.00	....	....	....	....	....	....	....
140	Galveston	[3] 36,981	1,200	1,200	1,140	....	2.50	2.00	2.00	1,500	1,200	1,200	....	....	2.00	2.00
	Oklahoma:															
97	Oklahoma City	53,273	1,200	1,200	....	3.00	2.50	....	2.00	1,800	1,500	900	....	....	2.00	2.00
	Arkansas:															
113	Little Rock	44,844	(2)	(2)	900	....	1.67	....	1.50	....	....	....	....	....	....	1.00
	V.—CITIES IN STATES OF THE WESTERN DIVISION.															
	Montana:															
135	Butte	38,669	$2,500	$1,800	....	....	....	$3.50	$3.50	(2)	(2)	....	....	....	$3.50	$3.50
	Colorado:															
27	Denver	207,112	(2)	(2)	$1,650	....	....	2.25	3.00	$4,000	$1,500	$900	....	....	....	....
125	Pueblo	42,999	2,000	1,500	936	....	....	....	2.33	900	600	900	....	....	2.00	2.00
	Utah:															
57	Salt Lake City	87,330	1,500	1,320	1,200	....	$3.50	2.25	2.25	900	900	900	....	....	2.25	2.25
	Washington:															
23	Seattle	221,491	(2)	(2)	1,159	....	5.00	2.50	2.50	1,500	750	....	....	....	....	2.50
49	Spokane	98,947	(2)	1,140	1,104	....	....	3.00	3.00	1,200	1,080	1,020	....	....	2.75	2.75
66	Tacoma	76,329	(2)	900	900	....	....	2.25	2.25	720	720	....	....	....	....	2.40
	Oregon:															
28	Portland	190,017	(2)	(2)	(2)	....	(2)	(2)	(2)	1,650	1,200	1,200	....	....	....	3.00
	California:															
11	San Francisco	410,343	3,000	2,400	....	$5.00	6.00	3.00	4.00	....	....	....	....	....	....	....
18	Los Angeles	290,868	2,340	2,340	(4)	....	....	2.50	2.25	1,800	1,320	1,320	....	....	2.50	2.50
41	Oakland	115,459	1,800	1,575	....	5.00	3.50	3.00	2.50	1,440	1,050	....	....	....	3.50	2.50
122	Sacramento	43,330	(2)	1,560	1,200	....	4.14	2.50	2.50	(2)	1,200	1,200	....	....	....	2.50

[1] City or consulting engineer.

[2] Salaries and wages for employees not reported here are shown in other columns of the table, owing to the fact that no segregation of employees was made on the pay roll.

CLASSES OF CITY EMPLOYEES: 1909—Continued.

that used for the same city in the other tables of this report; see page 85. For a text discussion of this table, see page 82.]

STREET-CLEANING SERVICE.							DUST-PREVENTION SERVICE.							GENERAL HIGHWAY SERVICE.							City number.
Highest salary paid.	Next highest salary paid.	Salaries of foremen and inspectors.		Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.	Highest salary paid.	Next highest salary paid.	Salaries of foremen and inspectors.		Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.	Highest salary paid.	Next highest salary paid.	Salaries of foremen and inspectors.		Wages of mechanics and skilled laborers.	Wages of teamsters.	Wages of unskilled laborers.	
		Annual.	Daily.						Annual.	Daily.						Annual.	Daily.				
IV.—CITIES IN STATES OF THE SOUTH CENTRAL DIVISION.																					
$1,500	$1,100	....	$3.00	....	$1.75	$1.75	....	....	....	....	....	....	....	$3,000	$2,500	....	$3.00	$3.00	$1.75	$1.75	22
(2)	(2)	....	2.50	$3.00	1.88	1.75	(2)	$525	....	....	....	$1.75	....	(2)	(2)	....	3.00	4.00	1.88	1.75	99
900	720	$720	....	....	1.75	1.75	(2)	(2)	....	(2)	....	1.75	....	(2)	(2)	....	....	....	(2)	1.75	157
900	900	900	....	....	1.50	1.50	$1,380	450	....	....	....	1.50	....	[1]3,600	2,000	$900	....	3.00	1.50	1.50	39
(2)	(2)	....	2.00	....	2.00	2.00	1,500	....	$720	....	....	1.75	$1.75	2,400	1,800	....	2.48	2.37	2.00	2.00	43
(2)	1,060	....	....	....	1.25	1.25	(2)	(2)	....	....	....	1.25	....	(2)	(2)	....	2.50	2.20	1.25	1.25	120
(2)	(2)	....	....	....	1.35	1.35	....	....	....	....	....	....	....	(2)	1,200	600	....	1.75	1.35	1.35	145
2,400	780	780	....	....	1.25	1.25	(2)	(2)	(2)	....	....	1.25	....	2,400	1,000	780	....	3.00	1.25	1.25	79
1,200	1,200	....	....	2.60	1.75	1.75	(2)	529	(2)	....	....	1.75	....	3,000	1,800	900	....	3.00	2.33	1.75	103
1,500	1,200	900	....	....	1.00	1.00	(2)	(2)	(2)	....	....	(2)	(2)	2,400	1,500	900	....	3.50	1.00	1.00	138
1,800	1,000	780	....	2.50	2.00	2.00	(2)	(2)	780	....	....	2.00	....	2,500	2,400	1,100	....	3.00	2.00	2.00	15
1,200	900	900	....	....	1.50	1.50	(2)	(2)	....	....	....	1.50	....	1,800	780	780	....	2.68	1.50	1.50	53
1,620	900	900	....	....	2.00	2.00	(2)	600	....	....	....	2.00	....	1,500	1,200	....	3.00	2.50	2.00	2.00	56
1,500	900	900	....	3.25	2.00	2.00	(2)	600	....	....	....	2.00	....	1,800	1,500	900	....	2.75	2.00	2.00	69
(2)	(2)	900	....	2.50	2.50	2.00	....	....	....	....	....	....	....	1,500	1,200	810	....	2.50	....	2.00	82
1,200	720	....	....	....	2.00	2.00	(2)	(2)	....	....	....	2.00	(2)	1,920	1,092	900	....	2.50	2.00	2.00	140
1,200	936	....	3.00	....	2.00	2.00	(2)	600	....	....	....	2.00	....	2,100	1,200	....	3.00	2.50	....	2.00	97
1,200	450	....	....	....	1.50	1.50	....	....	....	....	....	....	....	1,800	1,620	960	....	1.96	1.25	1.50	113
V.—CITIES IN STATES OF THE WESTERN DIVISION.																					
$1,800	$1,500	....	....	$5.00	$3.50	$3.50	(2)	(2)	....	....	....	$3.50	$3.50	(2)	(2)	....	....	$5.00	$3.50	$3.50	135
1,800	1,200	$780	....	2.40	2.25	2.25	$1,800	$1,200	$1,200	....	....	2.25	2.50	[1]$4,000	$3,000	$1,120	....	2.40	2.25	2.25	27
(2)	(2)	....	$2.00	....	2.00	2.00	(2)	600	....	....	....	2.00	....	1,680	600	....	$2.00	2.00	2.00	2.00	125
(2)	(2)	....	3.00	....	2.25	1.80	(2)	900	....	$3.00	....	2.25	....	1,800	1,500	....	2.58	3.25	2.25	2.25	57
3,600	1,800	1,159	....	5.00	2.50	2.50	(2)	(2)	....	....	....	....	2.50	[1]7,500	4,200	1,027	....	....	....	2.50	23
(2)	(2)	....	3.00	....	3.00	2.75	(2)	1,080	....	3.60	....	3.00	....	2,400	1,320	1,100	....	5.00	3.00	2.75	49
(2)	1,200	1,200	....	3.10	2.25	2.25	(2)	675	....	....	....	2.25	....	(4)	1,320	1,200	....	3.10	2.25	2.25	66
2,100	1,140	1,140	....	2.75	2.50	2.50	(2)	(2)	(2)	....	....	2.50	....	2,400	1,800	1,300	....	3.90	2.50	2.50	28
2,100	1,640	1,640	....	....	3.00	3.00	(2)	(2)	....	....	....	3.00	....	3,000	2,100	....	5.00	5.00	3.00	3.00	11
1,260	1,260	1,260	....	3.50	2.50	2.50	(2)	(2)	1,200	....	....	2.50	....	3,600	2,640	(4)	....	3.50	2.50	2.50	18
1,800	1,800	....	4.00	....	3.00	2.50	1,800	1,200	1,200	....	....	3.10	....	3,000	2,400	....	4.00	4.00	3.00	2.50	41
(2)	1,200	....	4.00	....	2.50	2.50	(2)	(2)	....	....	....	2.50	....	[1]3,600	2,100	....	4.00	4.00	2.50	2.50	122

[2] Population for April 15, 1910; estimate for 1909 can not be made.

[4] Not reported.

INDEX.

Accounts, schemes for uniform, 14; different orders of, 15.
Alleys, classes of, 64, 148; length, area, and average width, 74, 172.
Ashes, collection and disposal of, 40, 44, 120; cities with private arrangements for collecting, 48.
Asphalt repair plants, cities operating, 74.

Bridges, highway, number, length, and area, 76; over 50 feet in length, 76, 176; under 50 feet, 77, 182; cost of construction, 77.
—— steam railroad, number and length, 79.
Butchers' and market wastes, cities with private arrangements for collecting, 48.

City numbers, list of, 85.
Conduits, length of, 80.

Dead animals, collection of, 42; tons disposed of, 46, 49, 50; cities with private arrangements for collecting, 48.
Docks and wharves, cities reporting, 81.
Drawbridges, number, classified by type, 77, 78.
Durable pavements, classified by kind of surface, 66, 154; length and area, 67, 154; laid by contract and by city employees, 70, 160.
Dust-prevention service, character and importance of, 59; accounts, records, and reports, 59; sprinkling with water, 60, 138; use of dust preventives other than water, 62, 144; salaries and wages of employees, 82–84, 191.

Elevated street railways, mileage of, 78.
Employees, salaries and wages of, 82–84, 190, 191.
Expenditures, primary classification of, 14.

Foremen and inspectors, salaries of, 83, 190, 191.

Garbage, use of term, 36; collection of, 40, 120; disposal of, by city employees, 43; by contractors, 44; cities with private arrangements for collecting, 47; quantity reduced, 49; quantity incinerated, 50.
Gravel pits, cities operating, 75.

Highway service, accounts, records, and reports, 63; salaries and wages of employees, 82–84, 191.
Highways, use of term, 63; length and area of paved streets, 65, 72, 148, 151, 154, 163, 165, 167, 168, 170; of alleys, 74, 148, 172; of sidewalks, 75, 174; of bridges, 76, 77, 176, 182; street lighting, 80, 184; mileage and per cent distribution of streets and alleys, 148; area of principal classes of street pavements laid by contract and by city employees, 160.

Incineration plants, cities reporting, 50; quantity of refuse incinerated, 50.
Inspectors. *See* Foremen, etc.

Mechanics and skilled laborers, wages of, 83, 84, 190, 191.

Nondurable pavements, classified by kind of surface, 68, 155; laid by contract and by city employees, 70, 160.

Oil, use of, as dust preventive, 62, 144.
Outlays, classes of, 14.

Pavements, street, area laid by contract and by city employees, 70, 160.
—— bitulithic, use of term, 66; average life in years, 70; average cost of laying, 71; classified by year in which laid, 72, 165; length and area, 154.
—— block-asphalt, average cost of laying, 71; length and area, 154.
—— brick, average life in years, 67, 69; average cost of laying, 71; classified by year in which laid, 72, 168; length and area, 155.
—— cobblestone, length and area, 154.
—— creosoted wood-block, average life in years, 70; average cost of laying, 71; classified by year in which laid, 72, 167; length and area, 155.
—— granite and Belgian block, use of term, 66; average cost of laying, 71; length and area, 154.
—— oil-bound macadam, length and area, 68, 155.
—— sheet-asphalt, use of term, 66; average life in years, 69; average cost of laying, 71; classified by year in which laid, 72, 163; length and area, 154.
—— tar-bound macadam, average cost of laying, 71; length and area, 154.
—— untreated wood-block, average cost of laying, 71; length and area, 155.
—— water-bound gravel, use of term, 68; length and area, 155.
—— water-bound macadam, use of term, 68; length and area, 155; classified by year in which laid, 72, 170.
See also Durable pavements *and* Nondurable pavements.

Quarries, cities operating, 75.

Reduction plants, cities operating, 49; quantity of refuse reduced, 49.
Refuse, classes of, 36; methods of collection, 36, 39; of disposal, 37, 42; collection of garbage, ashes, and rubbish, 40, 41, 120; of dead animals, 42; cities reporting sorting of, 42; collection and disposal under private arrangement of householder, 47; reduction plants, 49; incineration plants, 50; horses employed by city in disposal of, 51; cities obtaining revenues from disposal of, 52; expenses of collection and disposal, 120.
Refuse-disposal service, accounts, records, and reports, 37; quantity of garbage, ashes, and rubbish collected, 39, 120; number of employees, 39, 120; expenses of collection and disposal, 39, 51, 120; salaries and wages of employees, 82–84, 190.
Rubbish, use of term, 36; collection and disposal of, 41, 44, 50, 120; cities with private arrangements for collecting, 48.

Salaries of highest paid officials, 82, 190, 191; of foremen and inspectors, 83, 190, 191.
Sewer service, use of term, 18; inadequacy of records, 18; scheme of accounts, 18; salaries and wages of employees, 82–84, 190; population and area served, 88; expenses of operation and maintenance, 89.
Sewers, mileage of, 20, 21, 22, 88, 94, 97; construction material, 21, 88, 94; manholes, 22, 89; catch basins, 22, 29, 89, 109; outlets, 23, 89; means of ventilation, 23; in-
Sewers—Continued.
verted siphons and siphons, 23, 89; storm-water overflows, 23, 89; distance from sewer outlet to nearest waterworks intake, 23; cost, or replacement value, of system, 23, 89; mileage built, 24, 97; classified by builder, 24, 97; methods of financing construction, 24; charges or special assessments for maintenance, 27; expenses of operation and maintenance, 27, 100; average number of employees, 27, 100; house connections, 27, 104; flushing of, 28, 108; cleaning of, 29, 109; volume of sewage discharged, 29, 30, 114; pumping of sewage, 30, 117; sewage-purification systems, 31, 32, 118, 119; sludge produced and disposition of, 31; cost of precipitation tanks, 32; removal of night soil, 34.
Sidewalks, number of cities reporting, 75; length of, 76, 174.
Skilled laborers. *See* Mechanics, etc.
Snow and ice removal, department supervising, 55, 136; expenses of, 58, 136.
Sprinkling. *See* Street sprinkling with oil *and* Street sprinkling with water.
Steam railroad crossings, number and length, 78, 79.
Street cleaning, necessity for, 54; methods of, 55; classification of records, 56; paved streets and alleys regularly cleaned, 57, 124, 130; occasionally cleaned, 57, 125; changes in character of service, 57; percentage of area swept, 57; frequency of, 58, 130; average number of employees, 58, 133.
Street-cleaning service, disposal of refuse, 54; accounts, records, and reports, 55; snow and ice removal, 55, 58, 136; imperfections of statistics, 57; salaries and wages of employees, 82–84, 191.
Street lighting, expenses of, 80, 186; number of cities using specified style of, 81; total number of lights in 1907 and 1909, 81.
Street pavements, *See* Pavements, etc.
Street sprinkling with oil, 62, 144.
Street sprinkling with water, length and area of streets regularly sprinkled, 60, 138; sprinkling by car sprinklers, 60, 139; quantity of water used, 61, 139; cost of, 61, 139; frequency of, 61, 139; special assessments for, 62; sprinkling by private associations, 62; number of employees, 138; equipment used, 138.
Streets, classes of, 64, 148, 151; length and area, with durable pavements, 65, 67, 148, 151, 154; with nondurable pavements, 65, 148, 151, 155.
—— paved, length, area, and width of, 65, 151; classified according to kind of surface, 154.
—— unpaved, length of, 73, 148.
Subways and tunnels for street cars, 80.

Teamsters, wages of, 84, 190, 191.

Unskilled laborers, wages of, 84, 190, 191.

Wages, of mechanics and skilled laborers, 83, 84, 192, 193; of teamsters, 84, 190, 191; of unskilled laborers, 84, 190, 191.
Warehouses, number, and area of floor space, 81.
Waste paper, disposal of, 45; cities with private arrangements for collecting, 48.
Wharves. *See* Docks, etc.

Stanford University Libraries
3 6105 022 602 325

CECIL H. GREEN LIBRARY
STANFORD UNIVERSITY LIBRARIES
STANFORD, CALIFORNIA 94305-6004
(650) 723-1493
grncirc@sulmail.stanford.edu
All books are subject to recall.

DATE DUE

NON-CIRCUL